The IRON AGE

May 2, 1957

The National Metalworking Weekly

How To Cut Your Production Paperwork P. 51

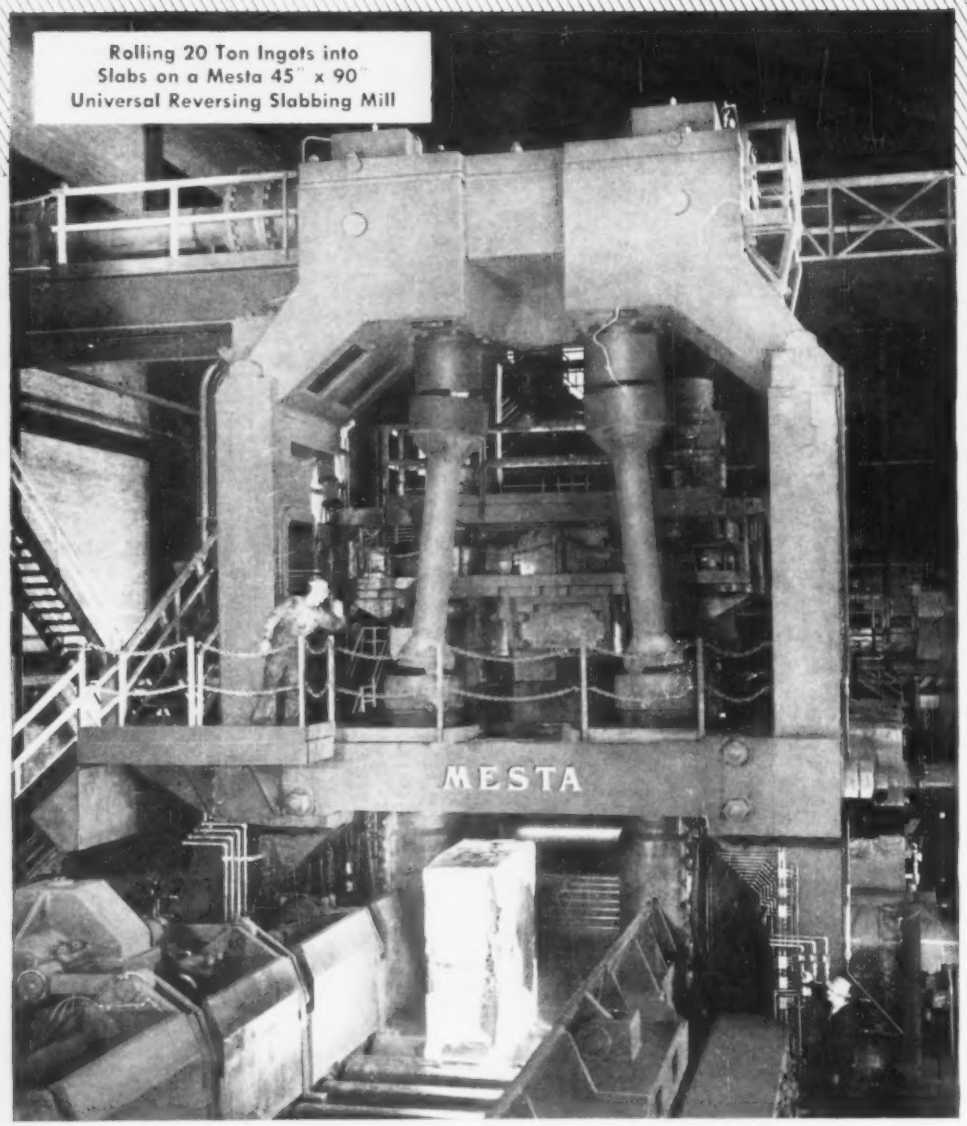
New Nitriding Method Uses Glow Discharge – P. 91

How Smaller Firms Use Operations Research – P. 56

Digest of the Week P. 2-3

SLABBING MILLS

Designed and Built by MESTA



Rolling 20 Ton Ingots into Slabs on a Mesta 45" x 90" Universal Reversing Slabbing Mill

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

PLANTS AT WEST HOMESTEAD AND NEW CASTLE, PA.

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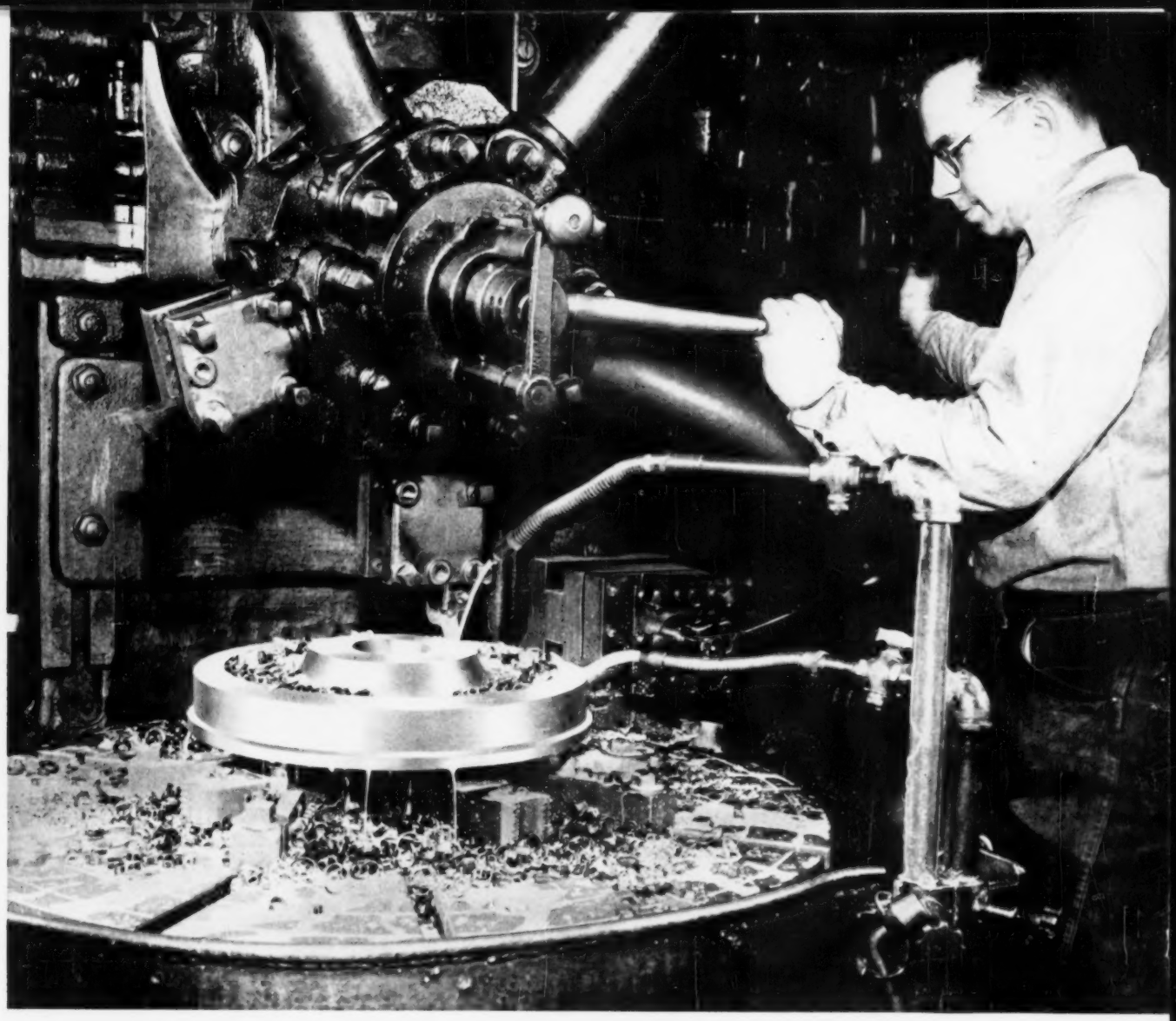

Another Good Gear on the Way

Here's a piece of work that is destined to become a transmission gear. The machinist has found it easy going because of the highly dependable blank he's using. Right from the start, he has had smooth sailing.

The blank was made by Bethlehem's forging-and-rolling process, a method of manufacture that is unique. By combining both forging and rolling in a single operation, this process imparts uniform density and smooth, regular grain flow. As a result, the metal cuts away cleanly and fast, and there is no hidden trouble to plague the machinist.

This is important. But even more important is *strength*. In Bethlehem blanks, there's strength in abundance—the strength and soundness essential for gears, crane wheels, sheaves, flywheels, and other circular products.

These sturdy steel blanks can be furnished in sizes to 46 in. OD, so there's a wide range of choice. There's also available an excellent variety of sections.

For full details, we suggest you call our nearest sales office—or write for Booklet 216, which contains more than 80 photographs and a wealth of helpful information.

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THE IRON AGE
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Indexed in the Industrial Arts Index and the Engineering Index.

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THE IRON AGE, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. Price to the metal-working industries only, or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $15; other Foreign Countries, $25 per year. Single copies 50¢. Annual Review Issue, $2.00. Cables: "Ironage," N. Y.

The IRON AGE

May 2, 1957—Vol. 179, No. 19

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*Starred items are digested at right

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NEWS DEVELOPMENTS

Look for Second Half Steel Pickup

Editor-in-Chief Tom Campbell predicts pickup in steel in September. Auto companies will be girding for '58 sales race as well as possible strike hedge when UAW contracts run out. **P. 54**

Ernest Weir Steps Down At National Steel

At 81, steel's lone wolf is ready to call it a day. Treasury Secretary George Humphrey will probably take position as chairman of board. Millsop becomes chief executive officer. **P. 55**

How Operations Research Can Work for You

You don't have to be an industrial giant to get benefits from operations research. One way is to adapt solutions to problems applied by larger firms. Here are some additional ideas. **P. 56**

Army Works on Airborne Atomic Power

Metalworking companies played big role in building Army's new Package Power Reactor. The prototype built at Ft. Belvoir is based on idea that components will be flown to remote bases. **P. 57**

Machine Takes Its Cue from Punched Tape

New 50 ton milling machine does three dimensional production machining guided entirely by punched tape. Said to be faster, more accurate. Now being used on aircraft

Metalworking

PAPER MAZE: Cooper - Bessemer Corp. put sweeping reforms to work when it learned 67 sheets of paper were needed to process an order for four bolts and a gasket (shown at left). The drive is saving the company thousands of dollars today. **P. 51**

parts, but has good potentials for wide industrial application. **P. 77**

Giant Grinding Machine Cuts Scraping Time

Mattison Machine Corp. has introduced a big grinder powered by a 150 hp motor. It can rough out castings and finish them to a flatness tolerance less than .001 in. **P. 59**

FEATURE ARTICLES

New Nitriding Process Uses Glow Discharge

No furnaces or salt pots are needed with this new nitriding process. Glow discharge surface hardening has already been used successfully on low alloy and a few stainless grades of steel. Highly efficient, it converts electrical energy into gas-ion energy and heat. Process claims to be faster; improves fatigue strength. **P. 91**

Weld Pipelines Faster By Automatic Process

Pipeline builders find automatic welding adapts well to double-jointing operations. It's faster, more uniform than manual welding. The welding head remains stationary while pipe sections revolve automatically. **P. 94**

Dress Your Grinding Wheels While They Work

Time out for wheel dressing in form grinding operations limits peak production. Now Perpetual Form Control eliminates the time out factor. **P. 96**

Precision Finishing Machine Boosts Shop Versatility

A new, multi-purpose precision finishing unit can straight or taper bore, turn, face, chamfer, groove or ream. A radically new multi-spindle unit saves time, effort, expense on a broad range of small work requiring precision finishing of close, multiple holes. **P. 100**

How To Straighten Large Shafts In an Emergency

A motor out of commission because of a bent shaft is costly. Two methods of on-the-spot correction are possible. A furnace and jacks is one answer; spot heating is another. **P. 105**

MARKETS & PRICES

Appliances Sales Are Off, But How Much?

Reports of poor appliance sales must be viewed in proper perspective. They are down from '56, but that was a record year. Inventory cutbacks at retail level make picture seem worse than it is. **P. 58**

Kaiser Plans Two-Piece Aluminum Food Cans

An order for 5.5 million two-piece food cans starts Kaiser off on "demonstration" production. Deep draw process will be used. Development will be watched by tinplate producers. **P. 62**

Ford Develops Lightweight Aluminum Frame

It's only being used on a military vehicle now, but Ford feels that experience gained will help it modify its new unitized aluminum frame for civilian cars. **P. 68**

Congress Cooling Off On Good Faith Price Bill

Firms interested in measure allowing them to lower prices in "good faith" to meet area competition probably won't get legislative aid this session. **P. 73**

Steel Mills Are Dipping Into Order Backlogs

Some mills are holding their ingot production rate at a high level. But some of this represents order backlogs rather than new business. Other mills report backlogs holding firm. **P. 139**

NEXT WEEK

Look Before Redesigning Your Products

Raymond Loewy, noted industrial designer, will offer tips to all concerned with product design in next week's issue. He will consider such points as customer appeal, manufacturing efficiency.

this ERIE press speeds extrusion

Presses like this—made expressly to extrude graphite electrodes—are routine specialization for Erie Foundry Company. This 450-ton press is now performing in the field, in typical trouble-free Erie fashion, providing faster extrusion work. The bed plate, rigidly attached to the press, eliminates the need for lining-up at our customer's plant, and assures continued accurate alignment. Die changes can be made in a matter of minutes by removing the clamp nuts and separating the half clamps by cranking.

Smoother Tamping Action

The operator controls the action of this Erie press smoothly and accurately by moving a hand lever in the same direction the ram travels. The further the lever is moved from vertical, the faster the ram travels . . . no other control valves are required. Fast advance and reverse speeds are achieved by auxiliary cylinders.

A similar carbon extrusion press rated at 2000 tons is now being assembled in the Erie Foundry Company plant. We invite you to see this press.

Erie Foundry Company would like to quote on your requirements. Please write

Hydraulic Press Division

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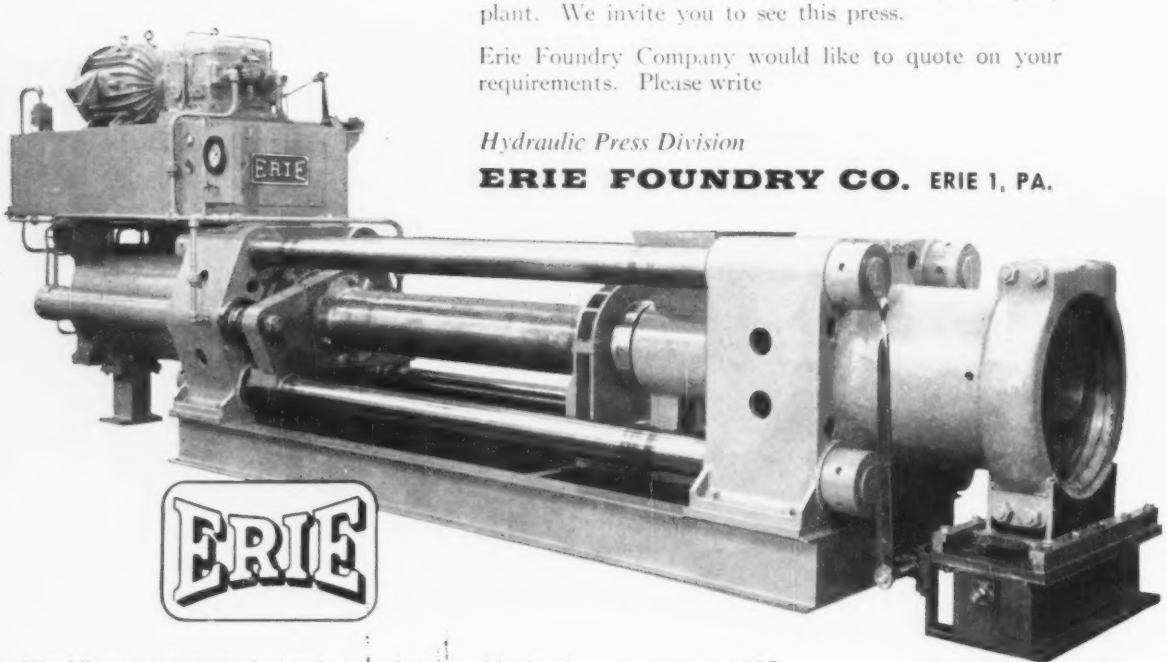

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"Stress raisers" eliminated by Link-Belt LXS chain design

LXS "FULL-ROUND" DESIGN

"Full-round" pitch holes . . . no sharp corners

"Full-round" pin

"Full-round" bushing

"FULL-ROUND" DESIGN eliminates stress concentration points. Heat treatment of all parts adds even greater strength and extra wear life to selected steels. Accurate control of these processes avoids brittleness, poor wear values and low tensile strengths . . . and assures uniformity.

Large pins, bushings mean ample live bearing area for long life

For long life under severe conveyor and drive conditions, Link-Belt LXS chain provides extra strength, increased wear resistance and wider application flexibility. This fabricated steel roller chain incorporates many advanced design and manufacturing refinements, resulting in superior ruggedness and accuracy.

Eliminate weak points

"Full-round" design does away with stress concentration points most frequently subject to failure . . . provides maximum live bearing area between pin, bushing and sidebars. As a result, stress is distributed evenly, increasing chain life.

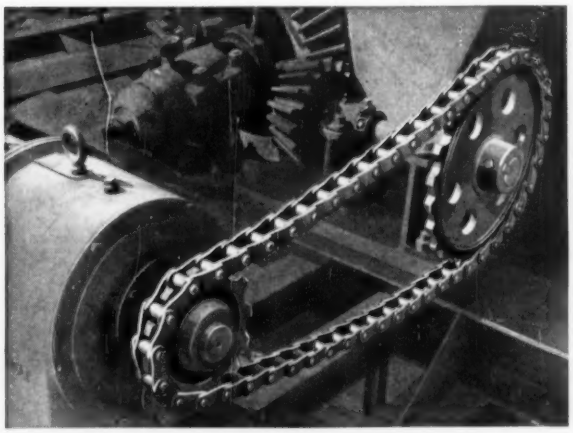
Pins and bushings are accurately sized for controlled press fit, preventing rotation in sidebars. Made from selected bar steel, sidebars are carefully machined for proper pitch hole size and for maintaining firm, tight press fit of pins and bushings. This assures close control of pitch and proper chain length after assembly.

Hardening extends life

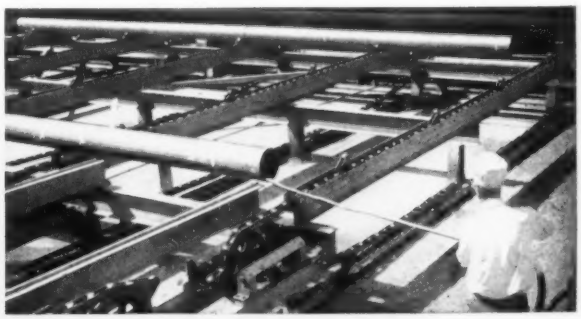
Another Link-Belt long-life extra is the controlled hardening of selected steels used in the manufacture of LXS chain. Pins, for example, are made from a tough steel, specially treated for high strength in shear and for maximum wear value. Bushings are properly hardened to shrug off shock and resist wear.

Rollers are accurately machined to assure proper operating clearances and free-rolling action. Controlled hardening gives them the necessary resiliency and durability.

LXS especially popular for exposed drives, high impacts



Link-Belt LXS chain is the long-life answer for exposed drives, abrasive and high-impact conditions. Its large, live bearing area reduces cutting action of abrasives because load is spread over a broad area.



LXS chain provides extra strength, wear-life for heavy-duty conveying

Link-Belt LXS chain has real stamina—as shown in this conveyor application for handling 1000-pound, 40-foot lengths of steel pipe. Thanks to accuracy of pitch and attachment spacing, plus close matching of multiple strands, LXS has the added strength and wear life for the extra-long conveyors so popular in today's move to mechanization.

HEADQUARTERS for chains, sprockets and other Link-Belt conveying and mechanical power transmission products is your nearby Link-Belt factory branch store or authorized stock-carrying distributor.

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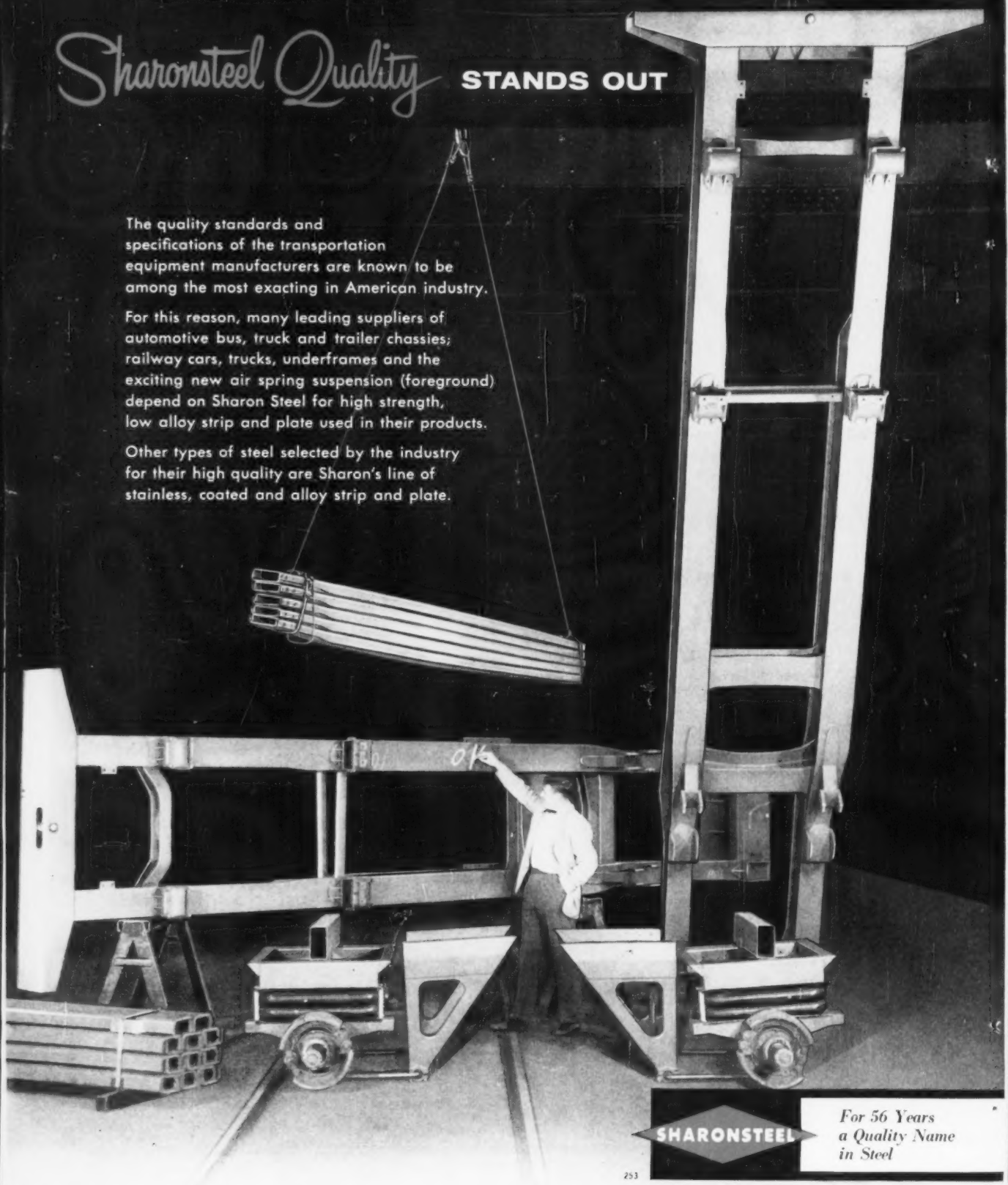
IN TRANSPORTATION EQUIPMENT, TOO

Sharonsteel Quality STANDS OUT

The quality standards and specifications of the transportation equipment manufacturers are known to be among the most exacting in American industry.

For this reason, many leading suppliers of automotive bus, truck and trailer chassies; railway cars, trucks, underframes and the exciting new air spring suspension (foreground) depend on Sharon Steel for high strength, low alloy strip and plate used in their products.

Other types of steel selected by the industry for their high quality are Sharon's line of stainless, coated and alloy strip and plate.



SHARONSTEEL

For 56 Years a Quality Name in Steel

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The Tables Are Turned
A Chuckle Is Due The Boss

Remember the old days—or remember reading about them—when the boss was a slave driver. He cracked the whip, took the biggest piece of pie and had no sense of humor?

The cartoonists always had a field day then. They showed the boss as a combination of: A sleight of hand character, a man so rich he had the gout most of the time and a gruff individual who wouldn't give you the time of day.

There was a time when some captains of industry were too rugged for their own good or for the good of their company. But they did have some fine points that you wouldn't read about in "Dynamite" or other earlier labor books.

Over the years management either saw the light or had it hammered into it or lost out to John Q. Public who, after all, runs the country.

But long after many industrialists stopped scaring babies, employees, and their wives they still had to take the blame for what their forebears may—or may not—have done. Even today it is good clean fun to be suspicious of your boss. You aren't hep unless you believe he needs watching all the time.

Is it any wonder that businessmen who for years have been uninspiring models of good behavior are now—privately—laughing their heads off at labor's dirty linen. Of course it's serious business but you know the old gag about the fellow who felt for you but couldn't reach you.

There's a lot more to come, too. For the first time in years, labor—through its big wheels—is on the defensive. It is also a little divided on how to handle the "washing." Which again harks back to the way some business organizations used to handle hot subjects.

But labor's job is even tougher. With the AFL-CIO merger still far from being a practical reality, the "cleanup" will be no easy matter.

Anyway the point of this piece—which some may incorrectly label anti-labor—is simple. Long explanations by labor leaders protesting the general innocence of labor may be true. But it is going to be one deuce of a job to get anyone to listen, let alone believe what is probably true.

Ask any old-time management man. He knows. His head is bloody from brickbats that should have been heaved at his grandpappy—or his great-grandpappy.

So give the boss his due. He has a few private chuckles coming to him—in between the steady lambasting that comes his way every day.

Tom Campbell

Editor-in-Chief

HOW THE ELECTRIC ROTATING MECHANISM IN I. B. LOCOMOTIVE CRANES increases operating speed and efficiency

Wherever crane rotation is unusually severe (magnet and bucket operations), an electric rotation unit (optional at extra cost) can be supplied with Industrial Brownhoist Cranes. The savings in maintenance and the greater efficiency plus the elimination of friction clutches offset the cost in a short time. The generator in the electric rotating motor is large enough to supply power for magnet service, and the complete rotation mechanism is easily accessible, being mounted on the top of the rotation bed. Reversing the flow of current through the motor, quickly and smoothly reverses the direction of rotation. • The carbody, trucks, monitor-type cab, and machinery arrangement of I. B. equipment have been equally well engineered. Write for Catalog No. 548 for complete information.

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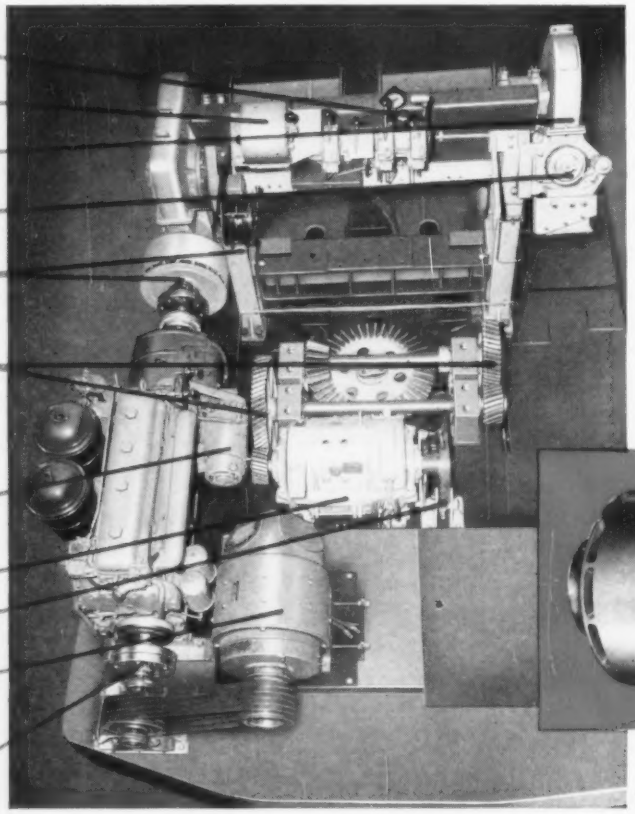
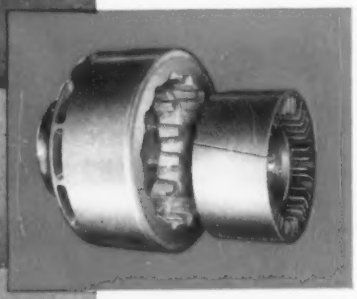
- ROTATING MOTOR
- ROTATING BRAKE
- ROTATING AND MAGNET GENERATOR SUPPLIES CONSTANT VOLTAGE
- FLEXIBLE COUPLING





THE DYNAMATIC CLUTCH between the engine and crane machinery is a driven rotor within a magnetic field assembly . . . mounted on friction bearings. A 32-step control gives accurate power response, eliminates torsional impulse and vibration and allows positive control in handling loads.

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BROWNHOIST

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LETTERS FROM READERS

Hard Sell

Sir—We read with interest your editorial entitled "There's No Sell Like the Hard Sell," in THE IRON AGE, Mar. 21, 1957, issue.

Will you give us permission to copy this editorial for publication in our internal house organ? We would appreciate hearing from you as soon as possible; you know how deadlines are.—C. Buckwalter, Irving Subway Grating Co., Inc., Long Island City, N. Y.

Permission granted.—Ed.

Electrode Selection

Sir—Please send me a reprint of the article "Rating System Simplifies Electrode Selection" by O. T. Barnett, in the Apr. 4 issue of THE IRON AGE.

I have been a subscriber to THE IRON AGE for the past year and four months. In that time I have read profitable and interesting articles in the various issues.—K. Waisane, Suffolk Industrial Welding, Huntington Station, N. Y.

Sir—I would like to request a reprint of the article "Rating System Simplifies Welding Electrode Selection." This article appeared in your Apr. 4, 1957, issue on pp. 91 to 96. It, like most of THE IRON AGE material, is well written from the practical point of view.—R. L. Custer, Welding Engr., International Harvester Co., Chicago, Ill.

Ten Commandments

Sir—I read with a great deal of interest your editorial "Businessman's Ten Commandments" that appeared in the Jan. 3, 1957, issue of THE IRON AGE.

We would appreciate receiving permission to reprint this article in our own informal newsletter, "Digests and Quotes," which is distributed to manufacturing management personnel at our Endicott Plant.—D. T. Piersol, Management Development, International Business Machines Corp., Endicott, N. Y.

Permission granted.—Ed.

Government Orders

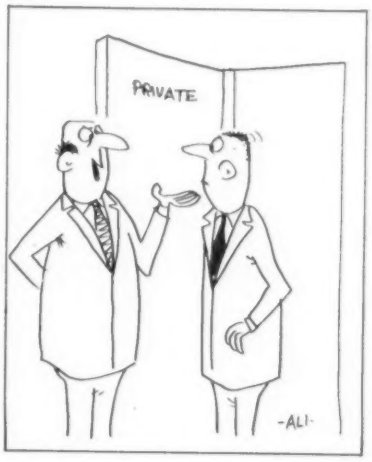
Sir—As a subscriber to your publication and a contractor who does a substantial business with the Government, your article on p. 51 of the Apr. 4 issue "How To Deal With Washington" was extremely interesting and thought provoking.

We are interested in receiving a half dozen reprints of the article and would be willing to pay for them if you are in a position to accommodate us.—D. Gerstein, Vice Pres., Government & Industrial Sales, Olympic Radio & Television, Long Island City, N. Y.

Sir—Please send us three copies of an article which recently appeared in your publication entitled "How To Deal With Washington."

The article was very informative and I wish to have the additional copies for use within our company.—A. E. Bodycombe, Vice Pres., General Conveyors Corp., Pleasant Ridge, Mich.

Copies are on the way.—Ed.



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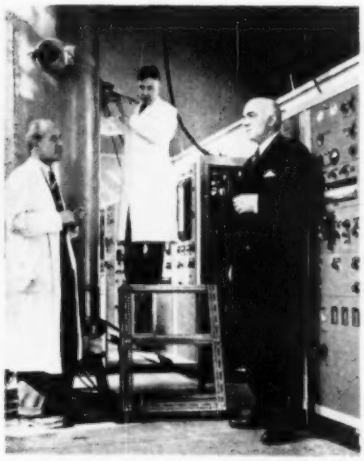
FATIGUE CRACKS

Ionitriding

Most heat treaters know a good deal about conventional nitriding. So that it's only now and then that we can project a note of novelty into what is fairly old business.

Glow discharge nitriding is new. And while we don't suspect you'll be in the market for an "Ionitriding" unit this week or next, we thought you'd like knowing what the new process is all about.

To get the full story (p. 91), our Metallurgical Editor went straight to the man responsible for introducing the process—Herr Bernard Berghaus of Zurich, Switzerland.



Inventor Berghaus, right, with glow discharge machine.

Herr Berghaus is an international industrialist with a flair for innovation. As the picture shows, he likes to spend time in the laboratory. Once a director of the fabulous Krupp, he owned metalworking plants in just about every other country in Europe. Right now, his new process has been contracted for by both the Swiss and German Westphalian governments.

As it happened, Herr Berghaus was touring New York at the time of the IA interview. So our man came no closer to an authentic model than the sounds of honking horns on Central Park South.

Offers Prizes

Graver Tank and Mfg. Co., Inc., is celebrating its 100th anniversary this year. The company has grown from an organization that employed only the two founding Graver brothers, to more than 4,000 people employed today in various plants and divisions.

Willard M. Broxham, Graver vice president and centennial chairman, says that Graver will offer prizes for information as follows: (1) where is the oldest Graver tank still in use; (2) who has the oldest picture of a Graver tank and (3) the best idea of decoration of a Graver tank or tanks (either in existence or planned).

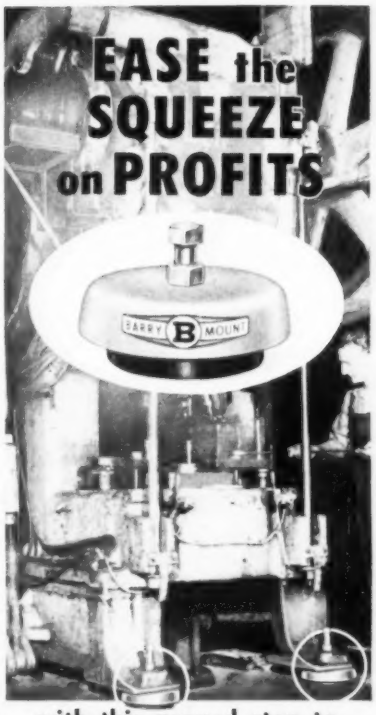
Hints—Mr. Broxham hints the first products were probably fabricated in the Pittsburgh area. There is also an indication in company records that their earliest products were probably office safes (no longer manufactured by Graver). All information and pictures must be mailed to the centennial committee, Graver Tank and Mfg. Co., Inc., East Chicago, Indiana, before Nov. 1st.

The prizes of $100 each are offered to the person who finds the oldest tank in use and the person who finds the oldest picture of a Graver product.

A $500 prize and two $250 prizes are being given for the best idea or actual decoration of tankage facilities, whether it be industrial, commercial or municipal.

New Puzzler

A peacock belonging to Mr. Jenkins lays an egg on the lawn of Miss Sullivan, a neighbor. To whom does the egg rightfully belong, Mr. Jenkins or Miss Sullivan?



with this proved step to

MORE OUTPUT

per machine

NOW YOU CAN HAVE new plant-layout flexibility that lets you put every machine right where it's needed to deliver full output on each job. Barry Mounts make even large machines "portable", level them, and eliminate need for anchoring to the floor. So it is easy to fit plant layout to production needs. And even *daily* plant-layout changes are fully practical.

PROVED SAVINGS

- Savings up to 20% in cost of production labor
- 90% saving in machine-installation cost
- Four-times faster set-up for special production

ARE HIGH COSTS SQUEEZING YOUR PRODUCTION — AND PROFITS?

Write for reprint of "The Iron Age" report on proved savings; also Barry Plant Survey Chart showing cure for eight production losses.

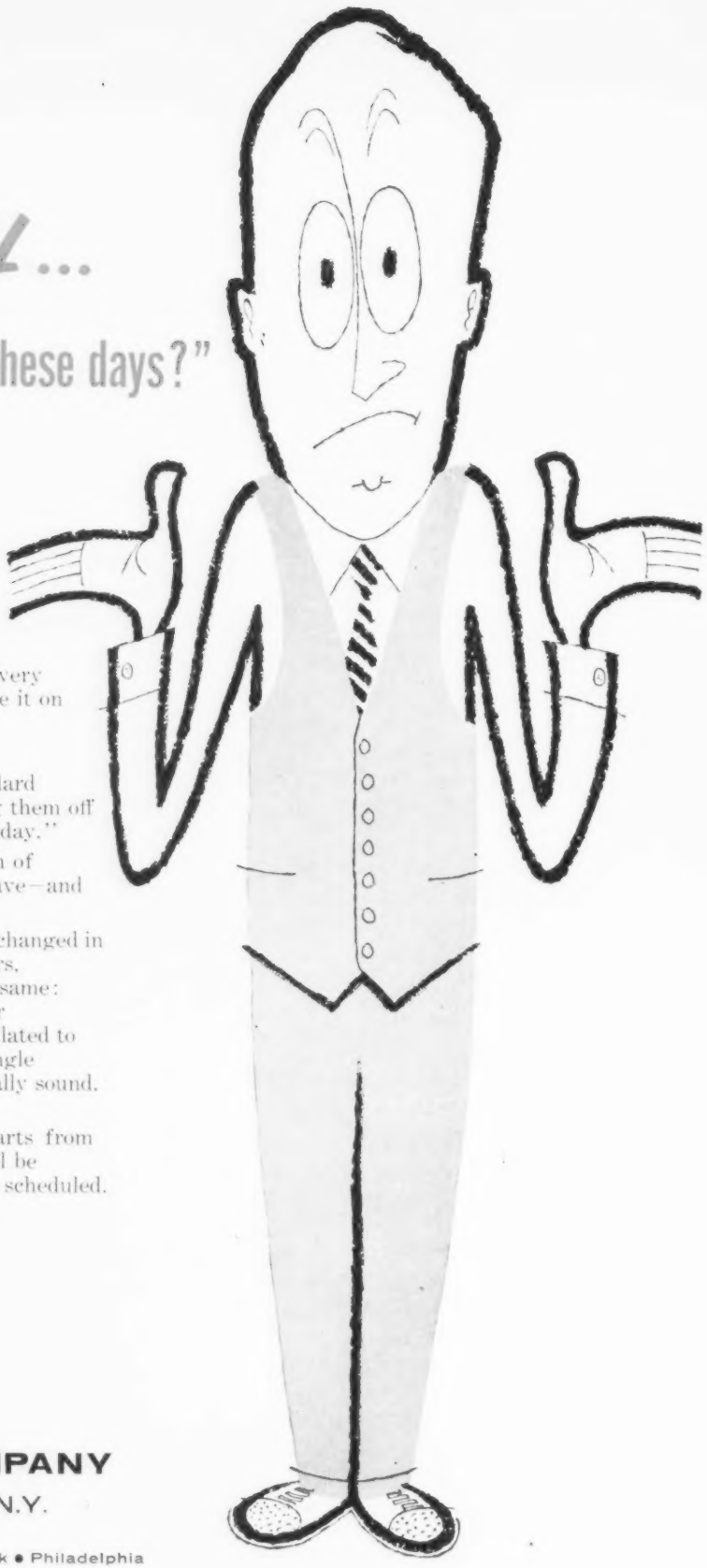
BARRY B MOUNT

BARRY CONTROLS
INCORPORATED
SOLD THROUGH INDUSTRIAL DISTRIBUTORS

795 PLEASANT STREET WATERTOWN 72, MASS.

"AFTER ALL ...

what can you expect these days?"



When quality isn't up to par or a delivery is three months late, should you blame it on the "times"?

Only if you're willing to!

There's no reason to accept sub-standard work and broken promises . . . passing them off as "industry's way of doing things today."

Here, at Crosby, we expect as much of our plant these days, as we always have—and so do our customers.

Although habits and attitudes have changed in many quarters during the last 60 years, our business policy has remained the same: Prices (which are fair to the customer and fair to Crosby) are carefully calculated to be complete. They are based on a single standard of quality and are economically sound. Delivery promises are made to be met.

When you order metal stamped parts from Crosby, you can be sure that they will be produced as specified and delivered as scheduled.

METAL STAMPING SINCE 1896 · THE CROSBY COMPANY · BUFFALO, N.Y.

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195 Pratt Street, Buffalo 4, N.Y.

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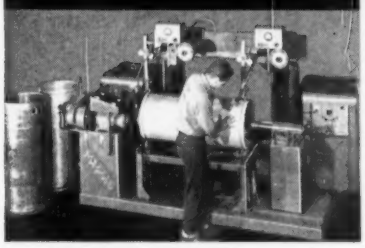
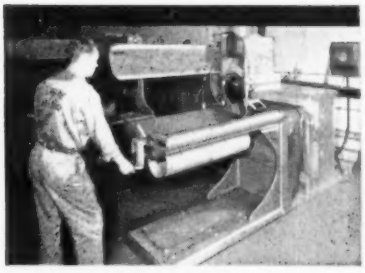
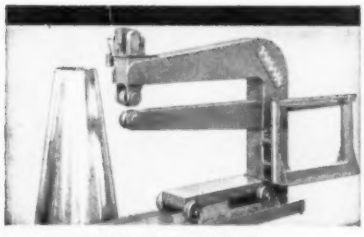
how to make fusion butt welding a *push-button operation*



CIRCUMFERENTIAL
automatic welding fixture
Designed for circular welding of components with automatic chucking and ejection of parts and transfer. Chuck expands internally for sizing. Surface speed to 300" per min.



LONGITUDINAL *automatic fusion butt welding fixture*
Hold-down fingers with "toe touch" control lock parts in position for welding. Back-up mandrell with up to 6 copper inserts permits fast job changes. Handles all weldable metals .005 to 1" thick and lengths from 2' to 12'.



ROLL PLANISHING FIXTURE
Cold-rolls and smoothes fusion welds (circ. & longit.) under controlled pressure up to 10 tons. Handles 1¾" to 10' dia. and lengths to 16'.

Write today for further information
785 No. Prairie Ave., Hawthorne 2, Calif.

Airline WELDING
WELDING & ENGINEERING
FIXTURES & POSITIONERS
"guides the arc to the mark"

EXHIBITS, MEETINGS

Engineered Castings Show — May 6-10, Cincinnati. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

Design Engineering Show — May 20-23, New York. (Clapp & Poliak, 341 Madison Ave., N. Y. 17).

Packaging & Handling Show—Oct. 28-31, Atlantic City. (SIPMHE, One Gateway Center, Pittsburgh 22).

Metal Show — Nov. 2-8, Chicago. (American Society for Metals, 7301 Euclid Ave., Cleveland 3).

MAY

National Tool & Die Manufacturers Assn.—Spring meeting, May 5-7, Mayflower Hotel, Washington. Society headquarters, 907 Public Square Bldg., Cleveland.

Air-Conditioning and Refrigeration Institute — Annual meeting, May 6-8, The Homestead, Hot Springs, Va. Society headquarters, 1346 Connecticut Ave., N.W., Washington, D. C.

National Assn. of Architectural Metal Manufacturers—Nineteenth annual convention, May 7-12, Fairmont Hotel, San Francisco. Society headquarters, 228 N. La Salle St., Chicago.

The Porcelain Enamel Institute—Mid-Year division conference, May 9-10, Edgewater Beach Hotel, Chicago. Society headquarters, Associations Bldg., 1145 19th St., N.W., Washington, D. C.

Copper & Brass Research Assn.—Annual meeting, May 12-15, The Homestead, Hot Springs, Va. Society headquarters, 420 Lexington Ave., New York.

The Electrochemical Society—Annual meeting, May 12-16, Statler

Continued on P. 16

A COMPLETE REFRACTORIES SERVICE . . .

for the Steel Industry

OLIVE HILL BF and OLIVE HILL HI-FIRED brick rank high in any list of prominent and widely used brands of blast furnace refractories. Manufactured from dense-burning Kentucky flint fire clays by Grefco's unique manufacturing processes, OLIVE HILL brick set a standard for blast furnace refractory quality and workmanship.

Grefco processing of OLIVE HILL brick entails:

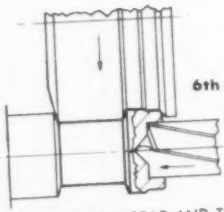
1. Careful selection, testing, stockpiling and blending of fire clays to insure uniform raw material quality.
2. Grinding and screening to prescribed formula to promote high density of product.
3. Efficient deairing during brick forming, also to promote density and proper physical structure.
4. Careful firing to exacting temperature schedules yields uniform high quality brick.
5. Close inspection of final product with gauging and sorting of brick to close size tolerance.
6. Quality control by statistical analysis procedures for the manufacturing processes.

In service, OLIVE HILL blast furnace brick, both BF and HI-FIRED, have produced many splendid performance records in the past. OLIVE HILL linings in presently operating furnaces, are giving outstanding performance and are more than meeting the increasing requirements of the expanding American Iron and Steel Industry.

GENERAL REFRACTORIES CO.
Philadelphia 2, Pa.

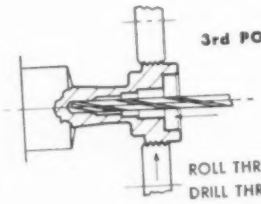
GENERAL REFRACTORIES

Acme-Gridley



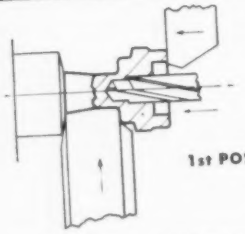
6th POSITION

ROUGH FORM REAR AND THREAD ROLL DIAMETERS.
FINISH FORM FRONT DIAMETER AND RADIUS END.
DRILL. SQUARE BOTTOM. SPOT.



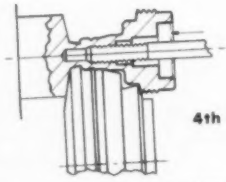
3rd POSITION

ROLL THREAD.
DRILL THROUGH HOLE.



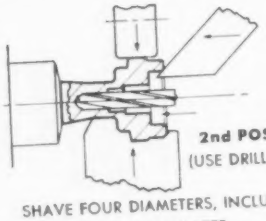
1st POSITION

ROUGH FORM ALL REAR DIAMETERS AND CHAMFER.
STEP DRILL. SQUARE BOTTOM. FACE END.



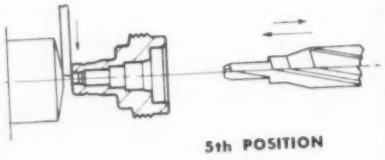
4th POSITION

FINISH FORM REAR DIAMETER AND ANGLE.
TAP HOLE.



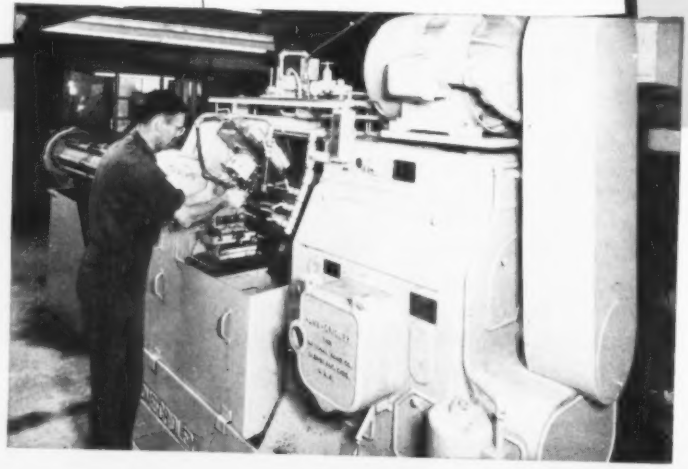
2nd POSITION
(USE DRILL SPEEDER)

SHAVE FOUR DIAMETERS, INCLUDING THREAD ROLL DIAMETER.
DRILL. TAP HOLE AND REAR SEAT ANGLE.
CHAMFER LARGE HOLE.



5th POSITION

ACCELERATE REAM TWO DIAMETERS AND TWO ANGLES.
CUTOFF.



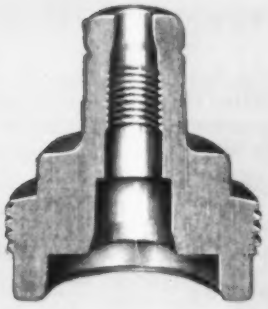
The operator, Clarence Tyler, also is happy with his Acme-Gridley. Tooled to complete one piece every 11¾ seconds, the machine can maintain that speed for as long as 16 hours before it is necessary to regrind tools.

gives NESS, INC. important production bonuses

Purchased primarily to eliminate secondary operations, this Acme-Gridley Six Spindle Bar Automatic has given a good account of itself in many other ways.

Says G. C. Pfrengle, General Manager of NESS, INC., "This 1¼" Acme-Gridley Six Spindle Automatic came into the shop and immediately went into production, without an extended 'get acquainted period'—notwithstanding the fact that we had not run this type of automatic previously. It has been completely satisfactory; we are especially pleased with the tool life and stability of the machine, which has resulted in a minimum of down time. And, since we are able to complete the part without secondary operations, costing is improved."

Owners of Acme-Gridleys will recognize immediately that the "*tool life and stability of the machine*," about which Mr. Pfrengle comments, is the result of plenty of "beef", properly distributed—a basic design principle of all Acme-Gridleys.



JOB FACTS

PRODUCED BY: Ness, Inc., multiple operation specialists in the production of automatic screw machine products, emphasizing close tolerances.

PART.....Bushing
MATERIAL.....B-1113 Steel
MACHINE TIME.....11¾ Seconds
NUMBER OF OPERATIONS.....14

INDEX . . . to lower machining costs... with *Acme-Gridley* **CONTROLLED CYCLE**

National Acme

THE NATIONAL ACME CO.
175 EAST 131ST STREET
CLEVELAND 8, OHIO

Sales Offices . . . Newark, N. J. . . . Detroit, Mich. . . . Chicago, Ill.

"MACHINERY ANALYZER saves us $1000 per hour..."

"We've had total savings of more than $100,000 since we purchased the analyzer three years ago. The analyzer has been shipped over 100,000 miles by air, rail, and car to our eight plants without need for repairs or replacements" — reports a leading chemical processor.

The Machinery Analyzer — actually a portable IRD Vibration Analyzer — is used for . . .

- TROUBLE-SHOOTING — to pinpoint faulty components exciting vibration *without costly dismantling.*
- MEASURING DISPLACEMENT — to accurately determine the condition of machinery *without costly dismantling.*
- IN-PLACE BALANCING — to dynamically balance at operating speed the accessible rotating components *without costly dismantling.*

Here are several examples cited by company officials:

- Detecting a broken gear in an important gear reducer saved a major loss of production.
- Savings of $2000 in balancing a ringer assembly because dismantling and loss of production were eliminated.
- A 450 HP motor was balanced, in place, at savings of $8000 to $10,000 in production and maintenance costs.

What portable IRD Vibration Analyzers are doing for this company — to reduce inspection, maintenance, and production costs — it can do for your company.

IRD

For further information — or an actual demonstration on your own machinery by an IRD field engineer — write today to International Research and Development Corporation, 797-1A Thomas Lane, Columbus 16, Ohio.

EXHIBITS, MEETINGS

Continued from P. 13

Hotel, Washington, D. C. Society headquarters, 216 W. 102nd St., New York.

Rail Steel Bar Assn. — Annual meeting, May 13-15, Broadmoor Hotel, Colorado Springs. Society headquarters, 38 S. Dearborn St., Chicago.

American Mining Congress—Coal convention and exposition, May 13-16, Public Auditorium, Cleveland. Society headquarters, 1200 18th St., Washington.

The American Society of Mechanical Engineers — Wood Industries Div. — Conference on automation in woodworking, May 16-17, Winston-Salem, N. C. Society headquarters, 29 W. 39th St., New York.

Industrial Heating Equipment Assn. —Spring meeting, May 19-22, The Homestead, Hot Springs, Va. Society headquarters, 1145 19th St., N.W., Washington, D. C.

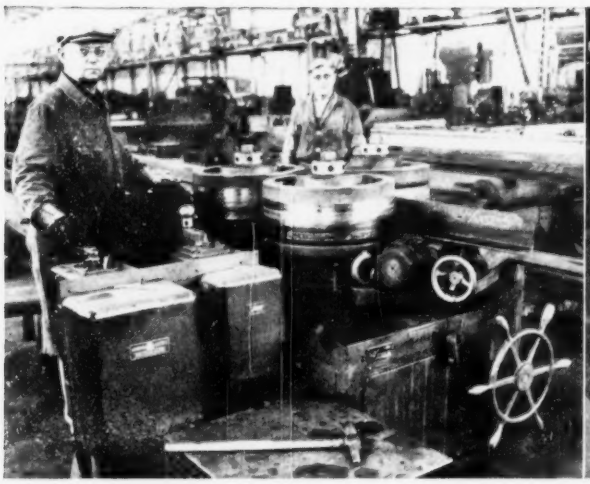
American Society For Quality Control—Eleventh annual convention, May 22-24, Sheraton-Cadillac Hotel, Detroit. Information: Wade R. Weaver, Registrar, Republic Steel Corp., Cleveland 1, O.

American Institute of Steel Construction—Annual national engineering conference, May 27-28, Edgewater Beach Hotel, Chicago. Society headquarters, 101 Park Ave., New York.

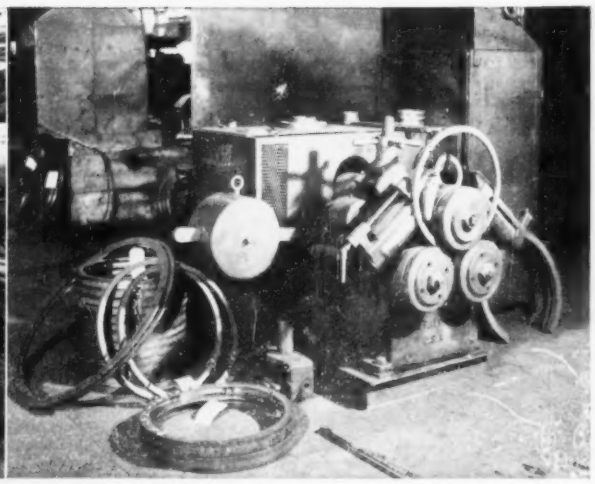
Institute of Mining and Metallurgical Engineers—Southern Calif. Section—Regional reactive metals conference, May 28-29, Ambassador Hotel, Los Angeles. Society headquarters, 29 W. 39th St., New York.

JUNE

Institute of Radio Engineers—National symposium on production techniques, June 6-7, Hotel Willard, Washington, D. C. Information: 609 Monticello Dr., Falls Church, Va.



UP TO 104-FT. DIAMETER RINGS for internal bracing of large elevated tanks — cold bent from heavy angles, leg-in, on "Buffalo" No. 5 Horizontal Bending Roll, to fractional-inch accuracy — by a leading fabricator. Machine uses no dies, only standard rolls.



FLATS BENT ON EDGE into spirals, which are then cut to circles and butt-welded — a high-production method used by major motor manufacturer for stator ring output. The "Buffalo" Vertical Bending Roll makes the job easy. Rolls are readily changed, adjusted to the shape and diameter.

"BUFFALO" BENDING ROLLS ARE PAYING THEIR WAY IN DIE-LESS COLD BENDING

If you bend structurals into arcs, circles, spirals or segments in any quantities, there is no cheaper method than with a "Buffalo" Bending Roll. Bridge fabricators, steel mills, heavy equipment builders, aircraft and automotive users — metal working industries by the score — enjoy the ease and speed with which their "Buffalo" Bending Rolls turn out commercially accurate curves.

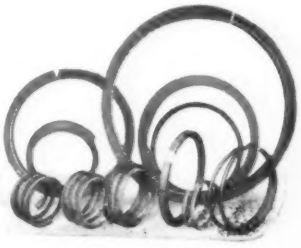
Steel warehouses have brought in profitable, new fabrication business by purchasing a Bending Roll. A mower manufacturer adapted his roll to apply the twist to his reel blades. Many firms use special rolls for 1001 highly specialized operations. All agree on the exclusive "Q" Factor* features of rigid, lasting construction, easy roll changes and diameter adjustments, simple operation requiring no highly skilled personnel — and no expensive die requirements.

Write for Bulletin 352 and check details on the model to put your bending operations on a paying basis — or bring profitable new business into your plant.

**The "Q" Factor — the built-in Quality which provides trouble-free satisfaction and long life.*

CONVEYOR MANUFACTURER gets fast output of curved sections involving angles and flats bent into arcs by "Buffalo" Bending Roll.

Any structural shape including tubes and pipes are easily and accurately bent to desired curves.



ESTABLISHED 1877 "Buffalo" MEMBER N.M.T.B.A.

BUFFALO FORGE COMPANY

492 BROADWAY BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING BENDING

New Westinghouse Life-Line H with silicone insulation

10 TIMES LONGER INSULATION THAN ANY OTHER STANDARD

Production Increases with Life-Line® "H" because you get top performance – reduced maintenance and down time. Here's how:

High-Temperature Silicone Insulation combined with the full complement of iron and copper for low-temperature standards – 60°C rise. Life-Line "H" insulation will last 10 times longer than ordinary Class B under all temperature conditions.

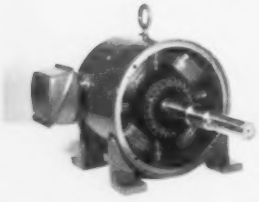
Controlled Ventilation – a new concept in motor cooling and cleaning – gives more capacity, longer life, and protection against damaging brush dust.

Fastest Response of any industrial d-c motor on the market – armature inertia reduced up to 55% – commutating ability increased 35%. You get closer regulation, faster accelerations, quicker reversals.

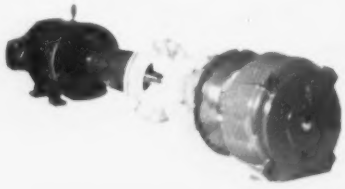
Greatest Protection of any industrial d-c motor through new housing design. In most cases, eliminates need for a splash-proof motor.

It's All New – with longer life, greater dependability, top performance. For all the facts about the Life-Line "H" call your Westinghouse sales engineer. Or, write Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pennsylvania.

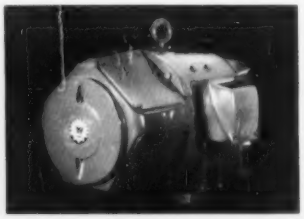
J-21990



New Silicone-Insulated Life-Line "H" is built and rated to meet low-temperature Class B standards. Insulation is eliminated as a limiting factor on motor life under normal conditions. Even with emergency overloads, Life-Line "H" will go right on working in many cases when ordinary Class B would fail.



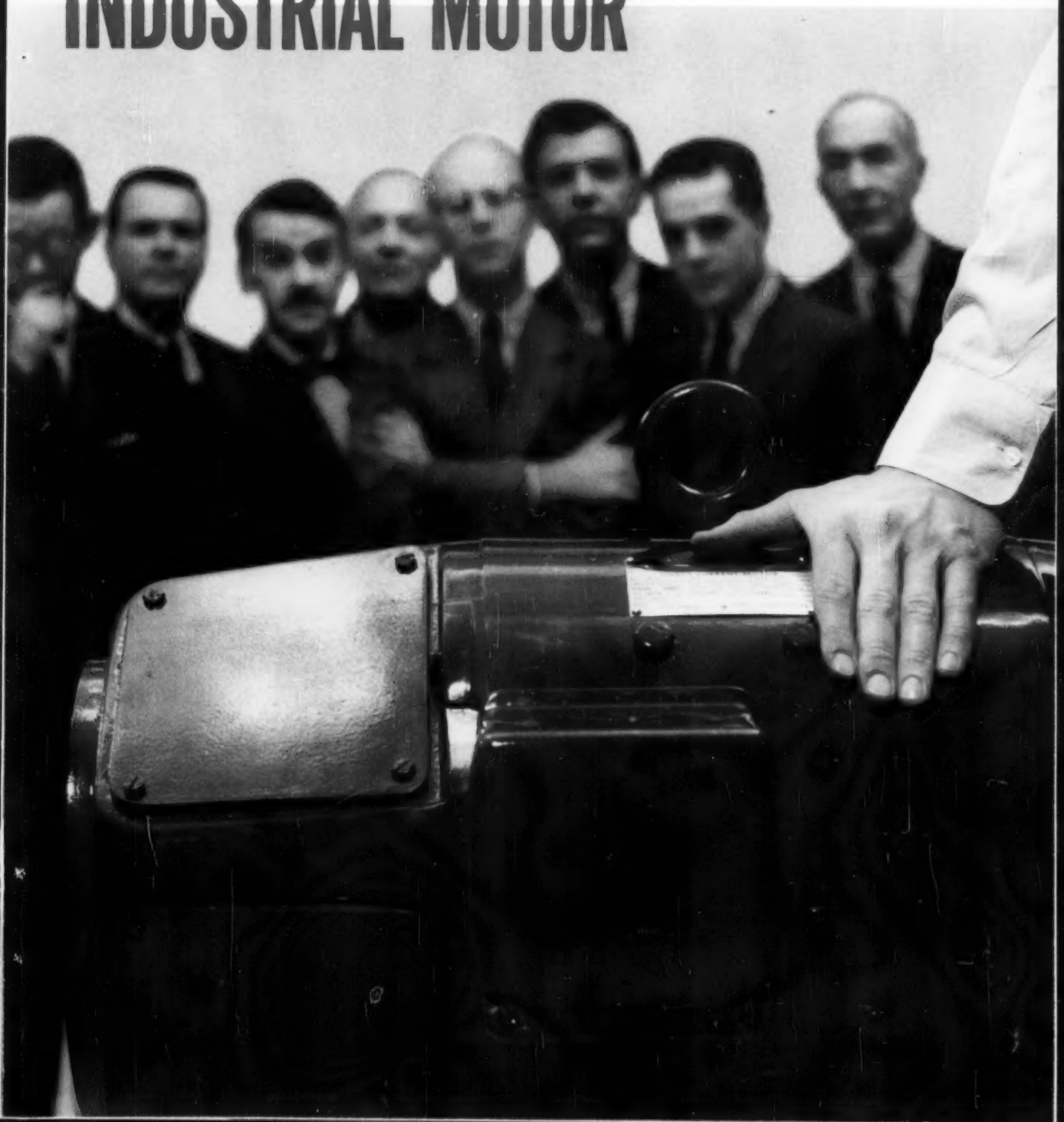
New Controlled Ventilation moves more air, positively distributes it to best advantage, cleans machine parts instead of contaminating them. Result – armature inertia can be reduced for faster response. Life-Line "H" lasts longer, increases production because maintenance and down time are reduced.



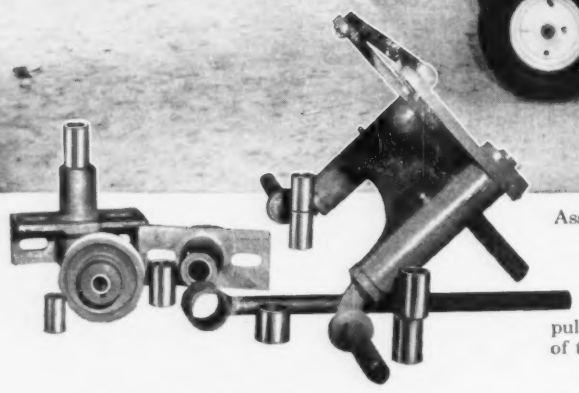
New Standard of Protection – All commutator access openings have sealing covers – ventilation openings face down. Dripping or running liquids are excluded. Maintenance and down time are reduced. Need for splash-proof machines eliminated in most cases.

YOU CAN BE SURE... IF IT'S Westinghouse

LIFE...MORE EXTRA-CAPACITY INDUSTRIAL MOTOR



Assembly line for the Beaver Riding Tractor



Johnson Bronze bearings are used in the pulley, pitman arm bracket and front axle housing of the Beaver Riding Tractor

Hard-Working Beaver Uses Maintenance-Free Johnson Ledaloyl Self-Lubricating Bearings

When the Baird Machine Co., of Stratford, Conn., decided to produce the versatile Beaver Riding Tractor, it represented quite a change from their well-established line of heavy machinery. The skill acquired in the manufacture of durable machines weighing tons had to be turned to building a tractor weighing only 430 pounds.

New problems soon found familiar solution, however, as Johnson Ledaloyl self-lubricating bearings were called upon to provide rugged, maintenance-free service at vital points. "When we started our tractor line we didn't have to look far for what we needed," says Mr. Carl F. Johnson, Purchasing Agent for Baird. "We simply called our distributor, who already was stocking the desired sizes of Johnson bearings. We were familiar with Johnson bearings, since we were using them in our heavy manufacturing division."

Since the Johnson distributor maintains adequate stocks of bearings, Baird never worries about inventory. A phone call replenishes the supply on any item the same day. Although Baird never had occasion to use it, they know that Johnson field engineering service is readily available in case of need.

Your Johnson distributor carries a large stock of standard precision bearings in three basic types. He will be glad to help you to improve your product while lowering the cost with standard Johnson bearings.

JOHNSON Bearings

Johnson Bronze

505 South Mill Street • New Castle, Pa.

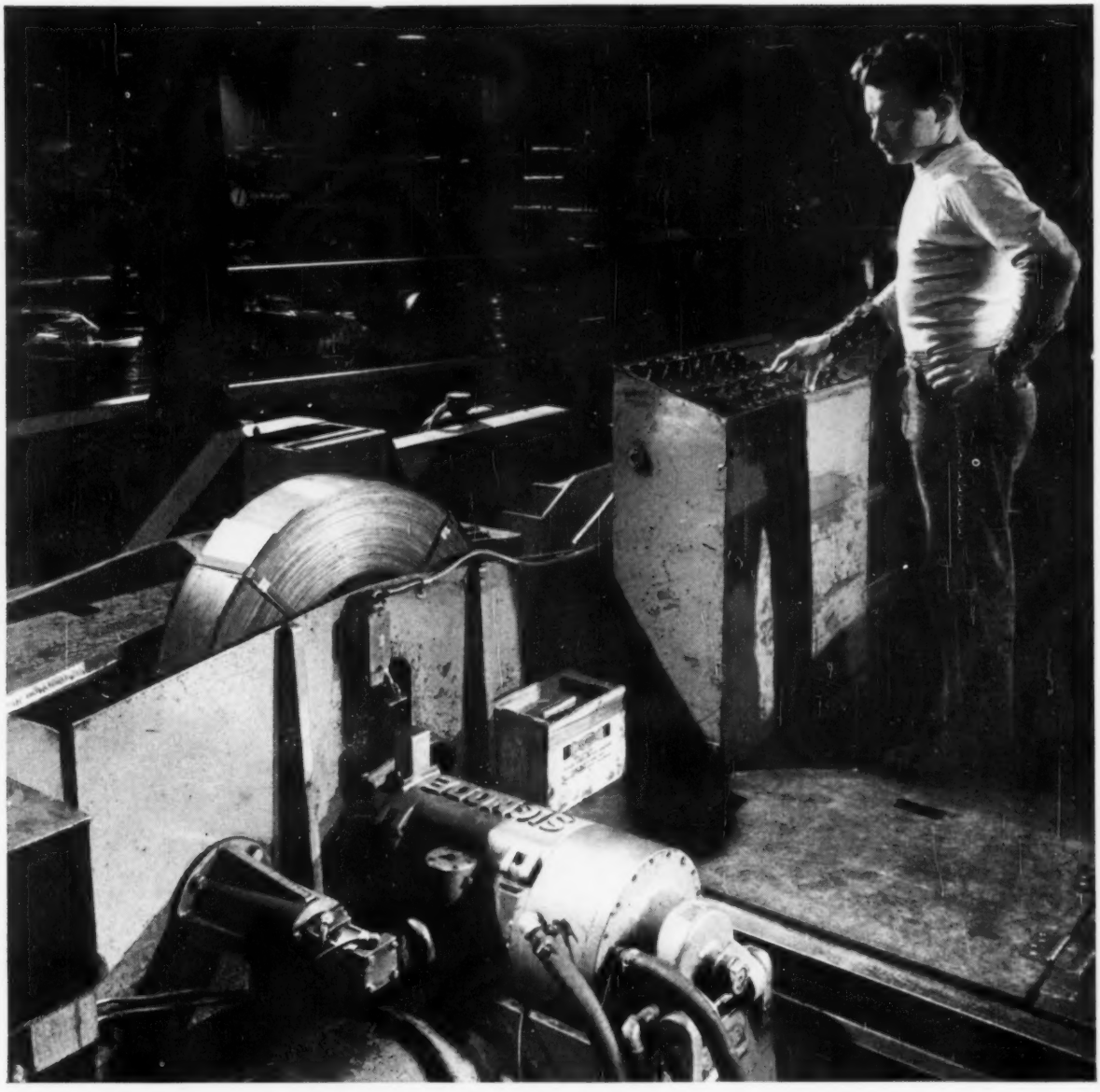
GRAPHITED
over 175 sizes

GENERAL PURPOSE
over 900 sizes

UNIVERSAL BRONZE BARS
over 400 sizes

LEDALOYL
over 400 sizes

ELECTRIC MOTOR
over 350 sizes



They handle steel . . . with care

This man and Signode's Model MH10 power strapping machine are applying four steel straps to a coil of strip steel. The operator has fast push-button control of strap placement and the strapping action. To position the coil, the machine turns it in the direction that tightens the outer laps. Air-operated plates squeeze the sides of the coil to square it up. Surface finish of the steel is protected. Edges aren't damaged in handling or transit. There's no waste. The coil is worth more, whether it's yours as manufacturer or destined to be yours as receiver. Protection of product integrity to destination is one way Signode makes things cost less to handle, store, ship and receive. For more ways, call the Signode man near you, or write:

SIGNODE STEEL STRAPPING CO.

2623 N. Western Avenue, Chicago 47, Illinois

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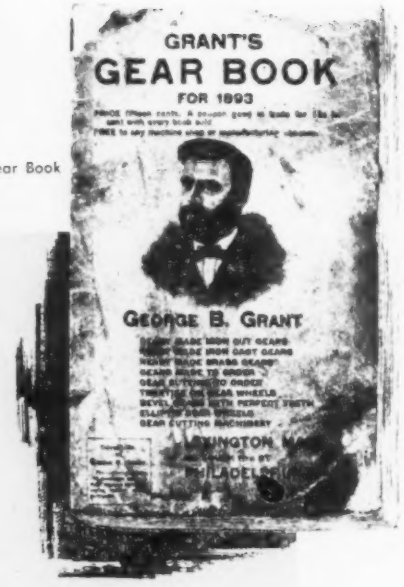
We've come a long way in...



Grant's "Gear Book for 1893".

YESTERDAY —

Philadelphia Gear Works was established by George B. Grant in 1892 for furnishing cut tooth gears at a time that cast tooth, or mortise gears with inserted wooden teeth, were used for transmitting power.

The contribution made by George B. Grant to the American gear cutting industry was considerable. He pioneered many gear firms in this country, some still in existence.

The first hobbing machine for cutting spur gears was built by Grant in 1887 (U. S. A. Patent No. 405,030). In 1899, he gave the hypoid its name though it was not until 1925 that a practical method was developed for producing these gears.

Grant contributed greatly to the development of the involute tooth by championing as early as 1885 the use of the involute form, at a time when there was much controversy over the involute versus epicycloidal tooth.

Grant invented an Odontograph and published Grant's Treatise on Gears which for many years has been the gearing text in use by colleges and engineers.

Machine built by Grant for cutting bevel gears in 1893.

The original plant occupied by Philadelphia Gear Works at 125 S. 11th St., Philadelphia.

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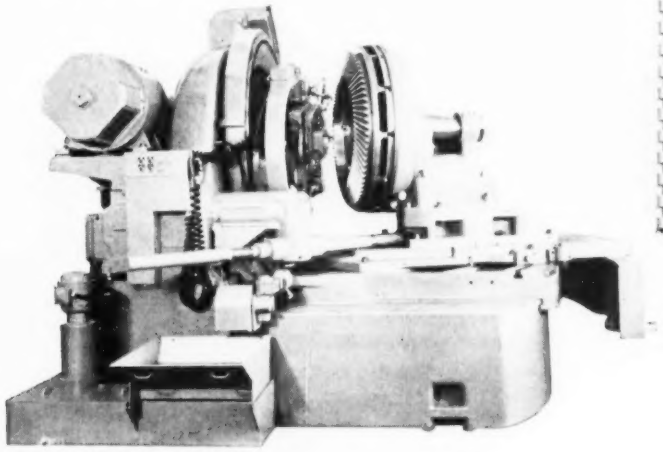
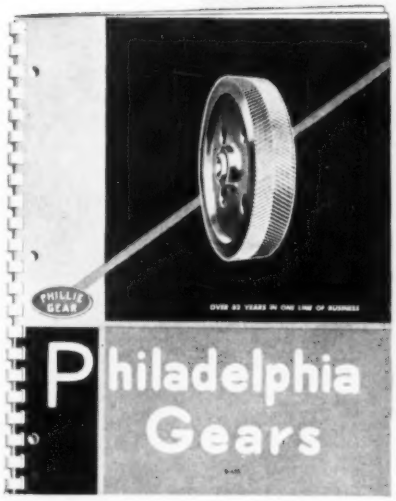
Philadelphia Gears are made to the highest standards of engineering skill and exactitude. They are the culmination of over 65 years' specialized experience in the manufacture of gears. Our shops are equipped with the latest gear making machines, many of which incorporate exclusive design features. Today our gear manufacturing facilities are among the largest and best equipped in the country. Our competent engineering staff, expert craftsmen and modern quality control facilities assure you of advanced gear design service and consistently better gears with longer life.



New No. 70 Spiral Bevel Generator designed to cut large spiral bevel gears up to 72" diameter, 10" face widths.



—it's practically a "treatise" on gears— Never before has so much helpful information been assembled between the covers of a gear catalog . . . 72 pages of illustrations, diagrams, definitions, tables, charts, and explanations regarding all types of gears. Write on your business letterhead for your copy.

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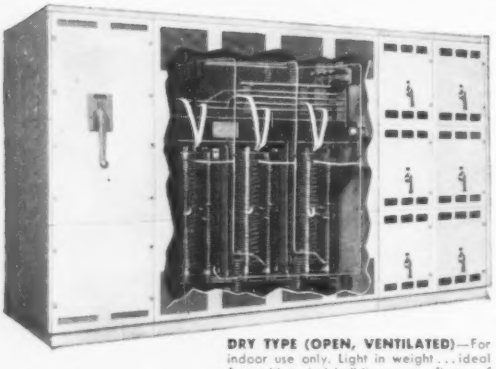

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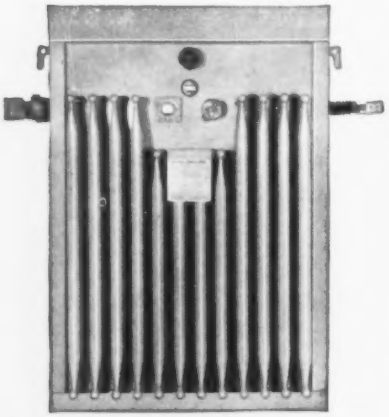
Nothing is more important to your plant than an uninterrupted flow of power. You can't afford to be handicapped by a system that is unable to meet expanding demands.

It will pay you to check over your distribution system—find out how adequate your transformers are for present and *future* load requirements.

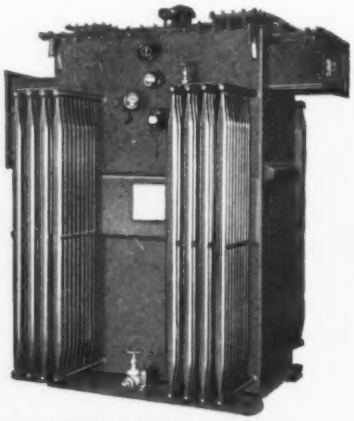
And it will pay you to specify Wagner PREDESIGNED Transformers for your load-centers. You will save time—save job engineering costs—and get liberally designed transformers with the switchgear of your choice. Wagner PREDESIGNED Transformers are engineered to meet heavy industrial demands. They are built in standard ratings which are coordinated with the specifications of unit substation builders.

Bulletins TU-205 and TU-214 give full information on Wagner Unit Substation Transformers for industrial power needs. Write for your file copies today.



CLOSE-COUPLED. These transformers fit flush against switchgear enclosures, eliminating throats and saving space . . . available in ratings from 500 through 2000 kva.

NITROGEN-FILLED. These Class H. Silicone Insulated Transformers offer many advantages in maintenance and safety. Suitable for indoor or outdoor use . . . completely fireproof. In ratings up to 2000 kva.



OIL AND NOFLAMOL-FILLED. Oil-filled transformers are generally used outdoors. Noflamol type is filled with a noninflammable liquid making it especially suitable for locations where explosive liquids and gases are present.

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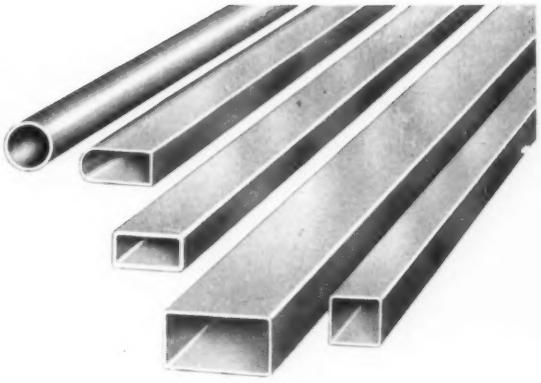


Tubing:

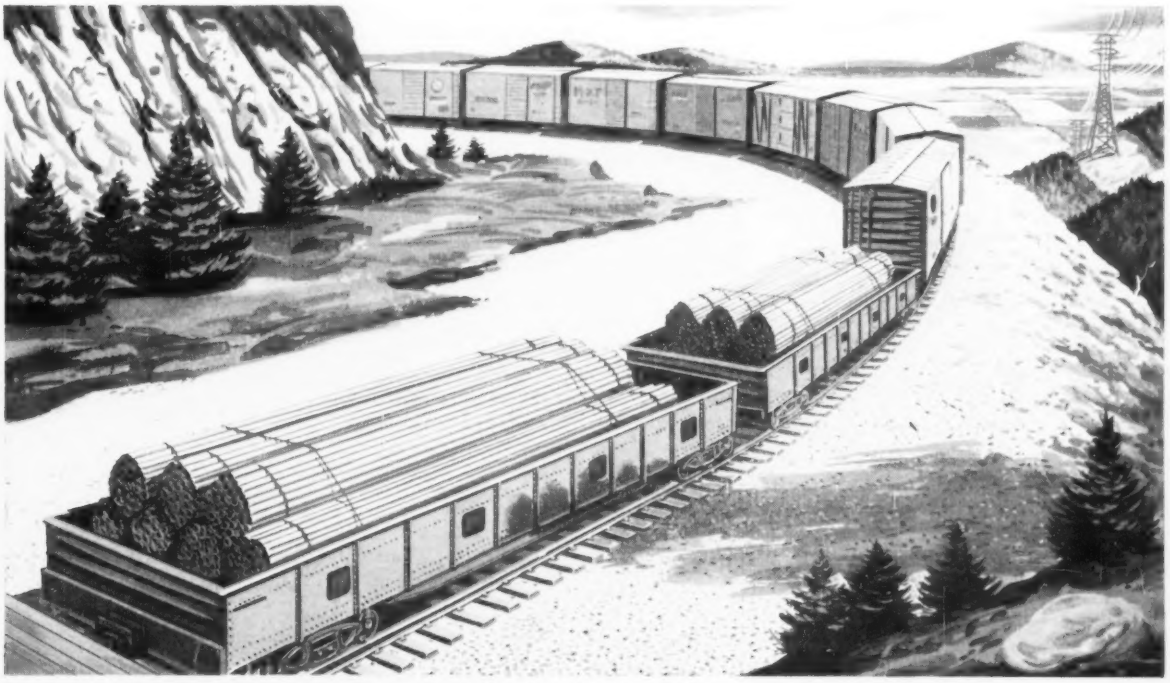
Assured delivery from an integrated mill...

As a buyer of steel tubing, what does the phrase . . . "from an integrated mill" mean to you?

To most of our customers it means just this: no company likes to have its markets jeopardized by production slow downs resulting from material shortages. When the "material" happens to be tubing and the supplier is an integrated mill such as Brainard, such shortages are virtually non-existent.

As an integrated mill, Brainard is not dependent on outside material sources. The corporation of which Brainard is a part controls tubing production from raw material source to finished product: thus customers are assured of an uninterrupted supply.

So, whether you buy tubing in small quantities or carload lots, you can benefit from this year-in-year-out dependability of supply by placing your orders with Brainard.



Brainard Steel Tubing

SHARONSTEEL

Brainard Steel Division, Sharon Steel Corporation
Griswold Street, Warren, Ohio

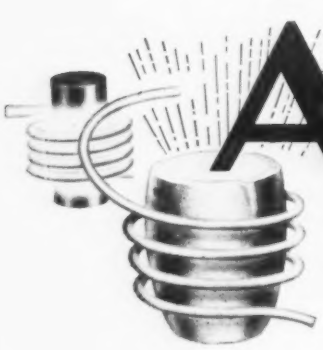
AJAX-Northrup furnaces mean new business for Adirondack

Three new Ajax-Northrup furnaces are *more* than paying their way at Adirondack Foundries and Steel Company, Watervliet, New York. Less than six months after installation, they opened a new half million dollar a year market, with promise of even doubling *that*.

Adirondack could easily handle the largest jobs in arc furnace steel, but not the low carbon, high alloy types. That's why The Company turned to Ajax-Northrup induction furnaces . . . the one efficient method of accurately melting these metals. Three Ajax-Northrup high-frequency induction furnaces with capacities of 2,000 lbs., 1,000 lbs., and 300 lbs. powered by a single 350KW generator met the need exactly.

From the start, Adirondack enjoyed fast melting under close control, low alloy losses, and amazing economy . . . economy that permitted the foundry to take, profitably, more than half a million dollars new business. The advantages of Ajax-Northrup induction melting equipment can be realized in your foundry, too, whether ferrous, non-ferrous, or both. Write Ajax Electrothermic Corp., Trenton 5, New Jersey, for additional details in Bulletin 27-B.

Associated Companies: Ajax Electric Company — Ajax Engineering Corporation

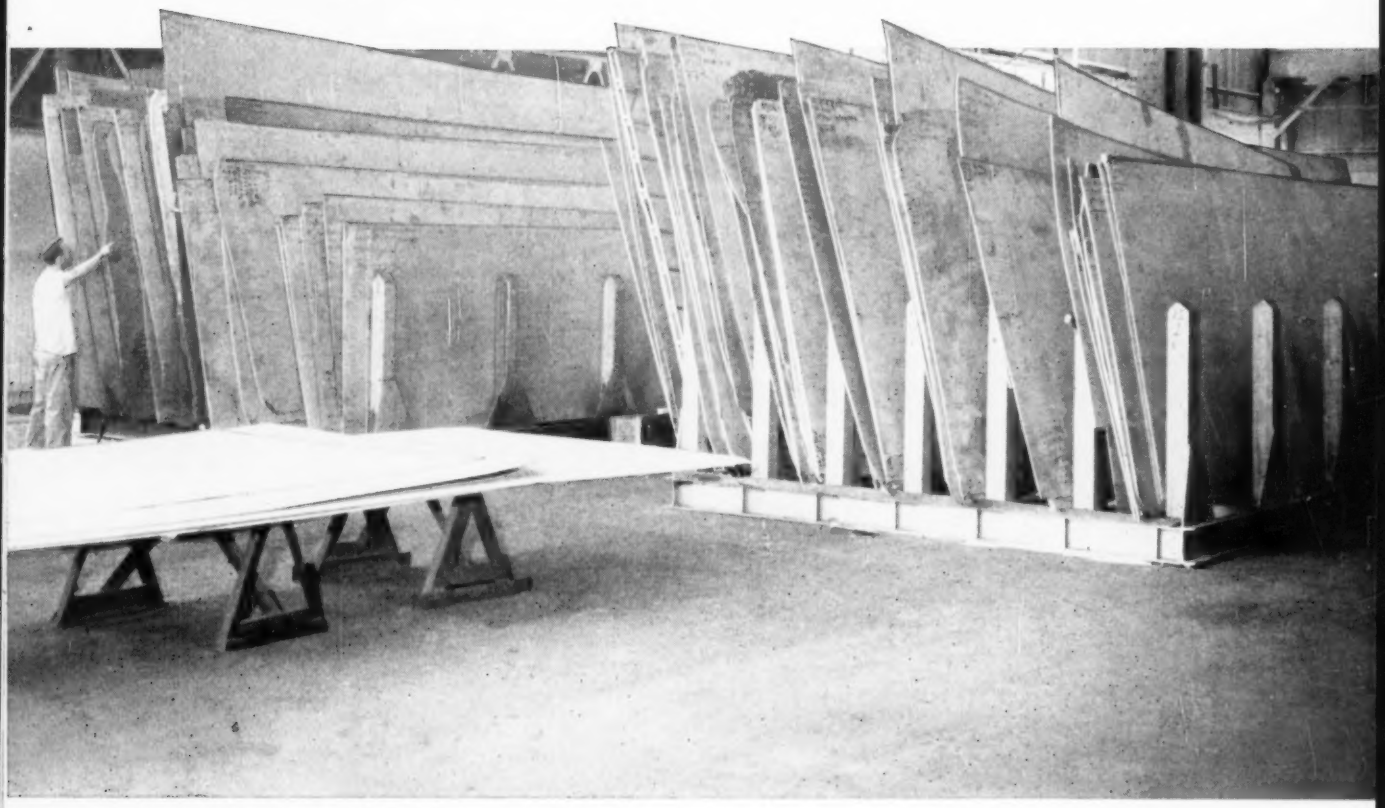


AJAX NORTHRUP SINCE 1916

INDUCTION HEATING-MELTING

Available now from Carlson

. . . any size and shape you want in Types 405, 410 and 430 stainless plate



Carlson's stock of Types 405, 410 and 430 chromium stainless plate is the largest ever. You can order plates, large or small, and get delivery in a few days. Types 405 and 410 find wide application in petroleum processing. Type 430 is generally used for furnace parts, annealing boxes and nitric acid storage tanks. Consider the 400 series if you need stainless plates right now.

Prompt delivery isn't your only advantage. These grades cost less than chromium-nickel stainless steels and if you need irregular shapes and sizes, experienced men with specially designed equipment can cut your plates and get them out in a hurry. Carlson provides a complete service with a flexible operation to take care of your specific requirements. This combination of stock, specialization and service saves you time and money, *gives you what you want when you want it!*

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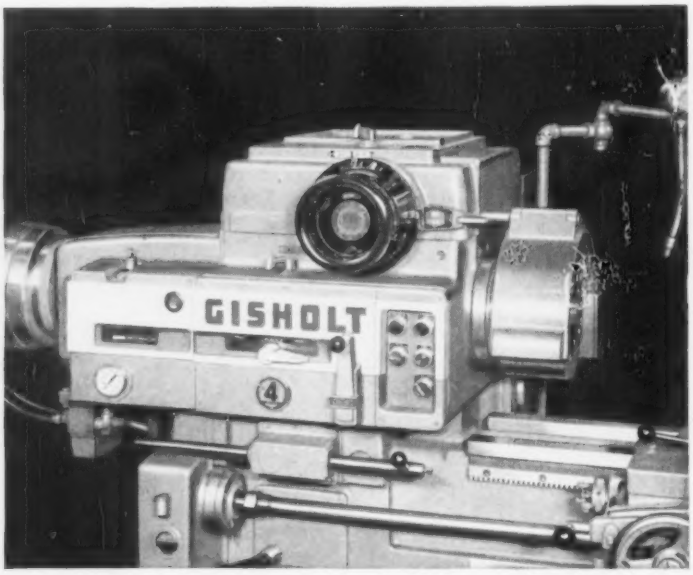

NEW HEADSTOCK GEAR TRAIN—sixteen different spindle speeds available, powered by up to 30 h.p. single-speed driving motor delivering full power at all speeds. Spindle is mounted on selected pre-loaded, precision-tapered roller bearings. Heavier, more rugged design provides smoother, quieter power.

HYDRAULIC SPEED SELECTOR—smooth, effortless speed changes. No waiting, no computing, no stopping of spindle, no releasing of main drive clutch. Operates direct or pre-set. Hi-Lo Lever permits instantaneous speed changes in 8:1 ratio without moving Speed Selector handwheel. Multiple Disc Clutches have automatic take-up for wear.

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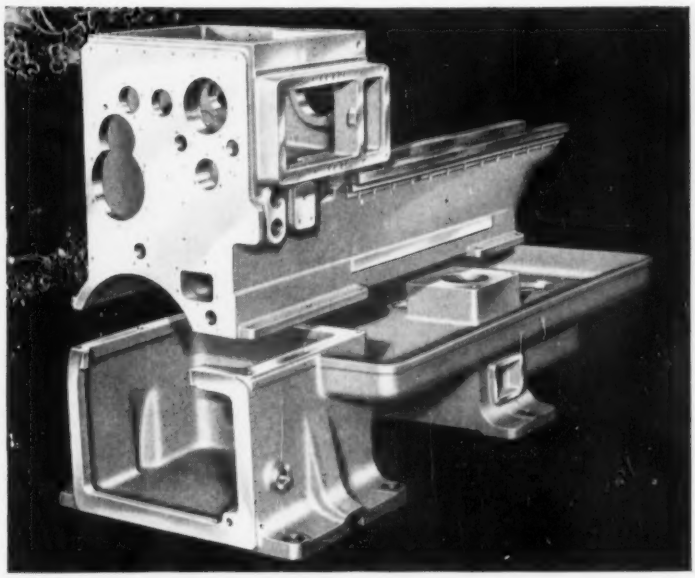
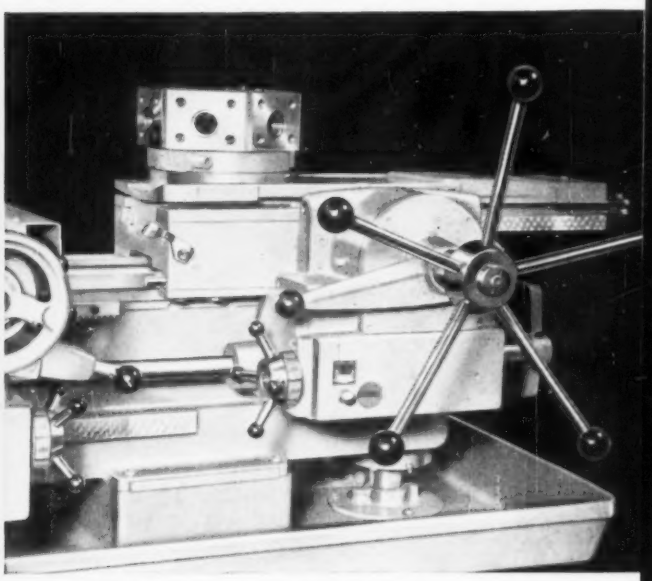


NEW HEADSTOCK AND BED CASTING—scientific design dampens out vibrations, assures smooth operation and simplifies holding closer tolerances. Made from semi-steel, poured in Gisholt's own foundry. Greater swing over ways permits bigger chucks and broader range of workpiece sizes. Provides a solid foundation for all types of work.



NEW TURRET RAM AND SADDLE—designed wider, heavier, more rigid to handle increased capacity and higher speeds. Dial-type feed selector makes feed changes faster, easier. Turret ram rigidly supported on 64-66 Rockwell C alloy steel way strips. Power transmitted through serrated tooth clutches, with shear pin protection against overloading.

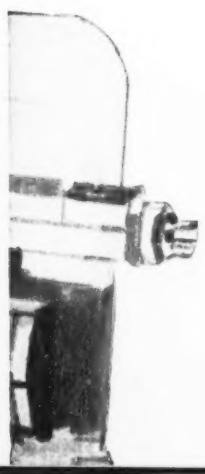
GREATER VERSATILITY...WITH THE

RAM TYPE TURRET LATHE

YOU'LL SPEED UP your production jobs—both large and small—with this more powerful, more versatile Gisholt MASTERLINE Ram Type Turret Lathe.

Here is a machine designed from end-to-end for easier setups, faster change-over and higher productive output than ever before. Check the advanced features illustrated above. Note the reserve power to handle your heaviest cuts—and to meet your tooling requirements of tomorrow. Note the extra spindle speeds—all at your operator's finger tips, without computing—for faster, better turning of any type material. And look over the new massive design, the over-all ruggedness that permits greater accuracy, closer tolerances, deeper cuts at punishing feeds without vibration.

Find out now how this powerful, flexible Gisholt MASTERLINE Ram Type Turret Lathe can reduce floor-to-floor time on your specific jobs. Call your Gisholt Representative today—let him show you how this advanced machine can fit most profitably into your production picture. Or write direct to Gisholt for the new literature described below.



READY NOW—all-new, 18-page illustrated Bulletin No. 1174-B, covering features, accessories, tools and floor plans on new Gisholt MASTERLINE Ram Type Turret Lathes. Ask for it!

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Special features for better production...

Versatile
ACIPCO
Centrifugally Spun
STEEL TUBES

New Cottrell five-color sheet-fed rotary letterpress for high speed production of fine quality boxboard printing. Photos courtesy of The Cottrell Company, Westerly, Rhode Island, a subsidiary of Harris-Seybold Company.

Cottrell rotary boxboard presses, built on the common impression principle, achieve remarkable color fidelity at speeds as high as 7000 sheets per hour. Available in 2, 3, 4, and 5-color models, they have many outstanding new features for better production.

The Cottrell spirally grooved plate cylinders in this high speed press were made from Acipco centrifugally spun steel tubes, "custom-made" for this application. Selected for strength combined with lightness, these tubes were furnished rough machined, 18⅞" OD, 13" ID, as cast, and 72¼" long.

Because of the intricate, accurate finish machining which was required, these tubes were furnished in Type 1045 steel. The inherently better machinability of Acipco tubes, plus their "built-in" qualities of dynamic balance and dimensional stability, helped Cottrell produce this better press.

If your steel tube application is a special one, and requires a combination of special qualities and properties, your investigation of versatile Acipco steel tubes will be worthwhile. A call to your nearest Acipco distributor will bring full information.

VERSATILE ACIPCO CENTRIFUGALLY SPUN STEEL TUBES

are used in the manufacture of calender, engraving, press, slitter, rewinder, plate cylinder, squeeze and starch bath rolls, as well as in hundreds of other industrial applications.

SIZE RANGE: Lengths up to 16'— longer lengths by welding tubes together. OD's from 2.25" to 50"; wall thickness from .25" to 4".

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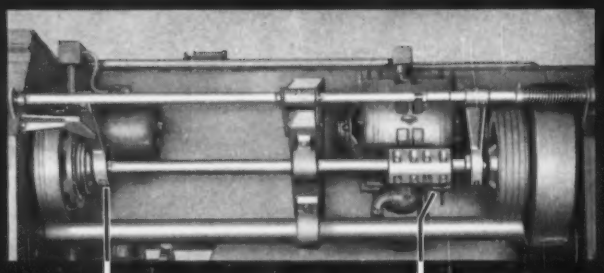
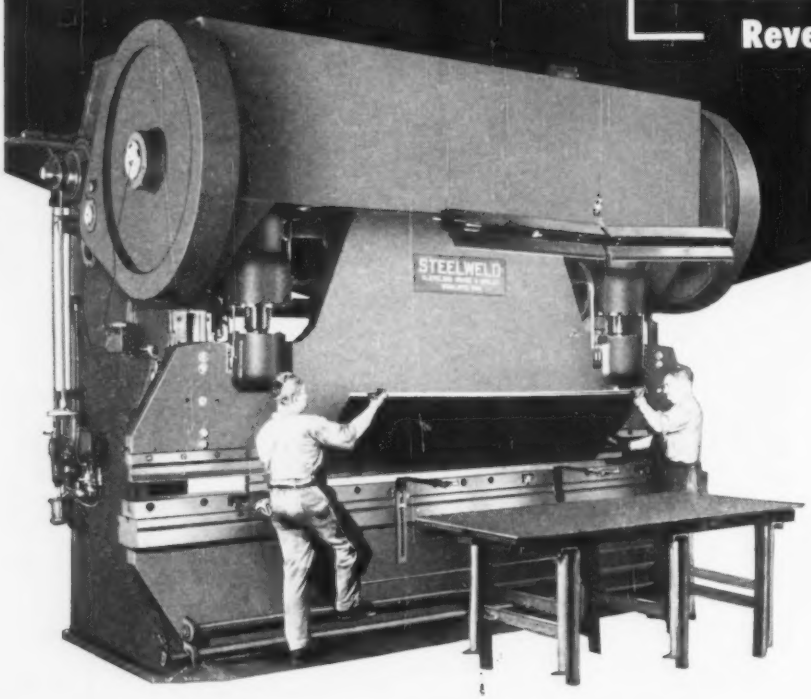
Reversing Ram Simplifies Press Operation





Model MO 6-12. Handles plate to 16'-6" x 7/16". Other Steelwelds available for working plate to 24 feet and thicknesses to one inch.

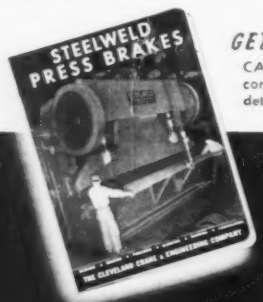
With a reversing ram drive you can back the ram or upper die away from the work at any point in the stroke. It is not necessary for the ram to continue through in one direction as when only the normal press drive is provided.

This feature speeds locating the correct ram position to achieve a specified bend or shape. It saves time and spoilage when trying new dies.

Reversing ram machines have two complete drives, including motor, flywheel and clutch. They are controlled by individual foot pedals on two different shafts, located one above the other across the front of the press.

The reversing ram feature is optional and may be provided on any Steelweld Bending Press. It adds greatly to the ease of operation and because of time-savings it enables, rapidly absorbs the extra original cost.

Steelweld Bending Presses are such versatile tools with so many outstanding features that we urge you to learn all about them. As a starter, send for the catalog below.



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Cr-Ni-Mn Steels

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...produced for less than 13c an hour!

Like many other industrial firms, Anaconda Aluminum Company has proved again that Plymouth locomotives *designed specifically for industrial service* deliver superior performance at lower cost.

"Although its Torqomotive Drive is the feature we like best about our 40-ton Plymouth," says H. G. Satterthwaite, Manager, "certainly its operating economy is also mighty satisfying. We operate our Plymouth Diesel 40 hours a week—haul everything from raw materials to finished products over 6 miles of track—on approximately one gallon of fuel per hour!"

These are some of Plymouth's features users say they find superior:

Extra reserve power—handling maximum loads without slip or strain.

Easy-reach controls—conveniently placed for "finger-tip" operation.

Lower per-ton-mile costs—through Plymouth-engineered developments.

Less maintenance attention—reducing the high cost of down-time.

Unmatched construction strength—giving bonus years of haulage life.

Wide-range selection—Gasoline and Diesel models from 3 to 80 tons meet most industrial needs.

Optional "Torqomotive" Drive—Plymouth's automatic hydraulic torque converter assuring shock-free handling, safer hauling of any load.

Let us show you why you get the most economical and efficient performance from a Plymouth locomotive expressly made for industrial haulage such as yours. Send us a brief outline of your operation. We'll submit a recommendation without obligation to you. Address: The Fate-Root-Heath Company, Dept. A-2, Plymouth, Ohio.

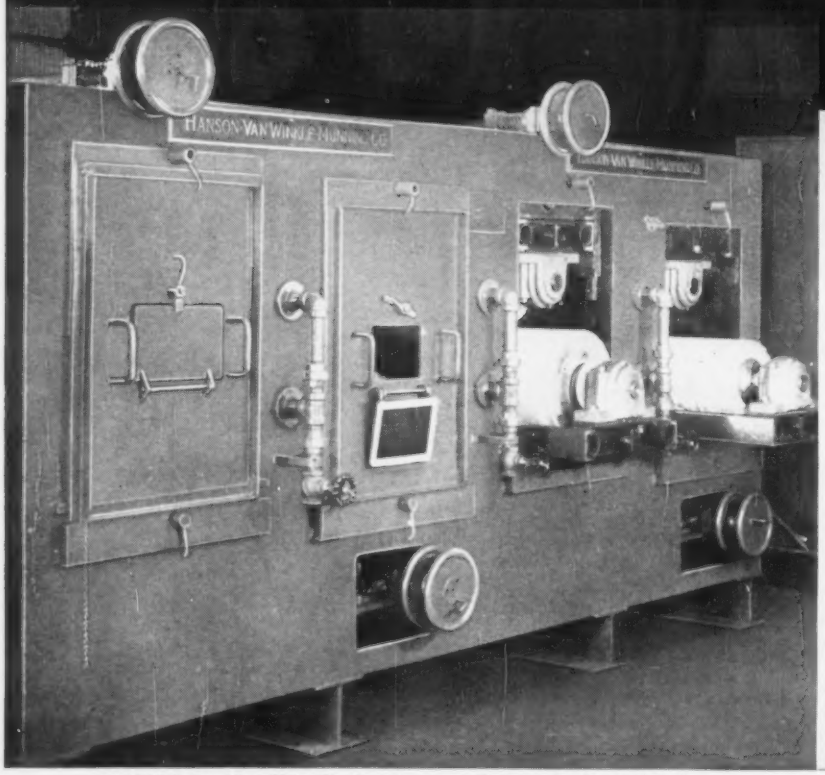
RAIL POWER

PLYMOUTH® LOCOMOTIVES

WITH TORQOMOTIVE DRIVE

PLYMOUTH LOCOMOTIVES in Progressive Industry throughout the world

CONTINUOUS STRIP AND SHEET METAL PROCESSORS



cut cleaning time to a fraction with this automatic H-VW-M SCRUBBER UNIT

H-VW-M Scrubber Unit. Brush units are pulled out for inspection. In a matter of minutes they could be replaced, if necessary with new brushes.

...and no down time either! Brushes are replaced easily while unit is in operation!

H-VW-M Scrubber Units—which adapt to fit into any system—are equipped with an exclusive, patented device that permits replacement of brushes *while the unit is running.* Just turn a few bolts, slide worn brush out, and insert replacement. Not a moment's production time is lost!

Add the advantages of this remarkable new feature to the enormous savings you'll realize in cleaning, reworking and inspection time, and you'll see why the rugged, efficient H-VW-M Scrubber Unit has no equal.

3149

Get more facts about H-VW-M Scrubbers, with their exclusive easy-brush-replacement feature, by writing today for Bulletin HB-100.

Hanson-Van Winkle-Munning Co., Matawan, New Jersey. Offices in principal cities.

H-VW-M

PLATEMANSHIP —Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

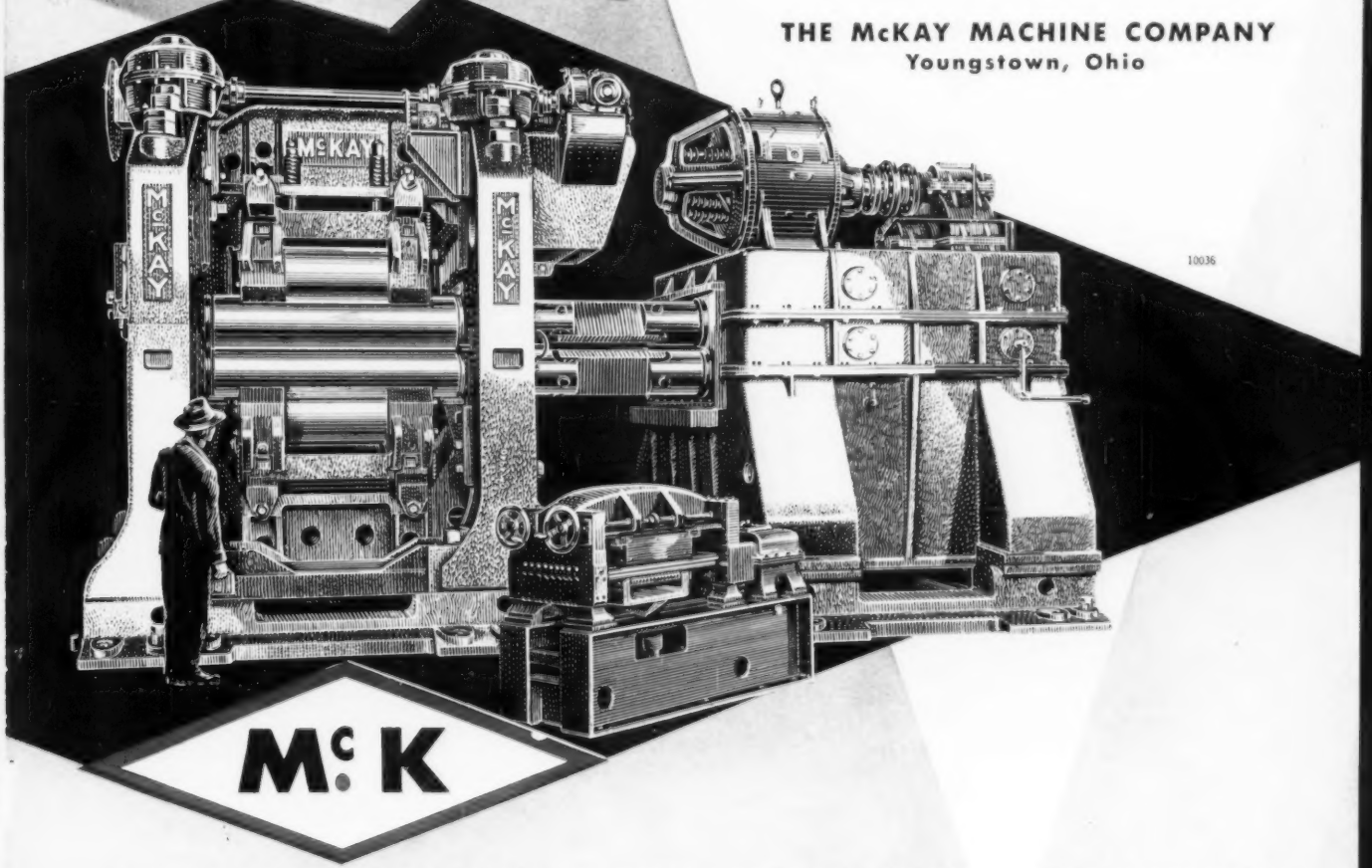
Hanson-Van Winkle-Munning Company, Matawan, New Jersey. Offices in principal cities.

McKay ROLLER LEVELERS

. . . From Tin Plate to Ship Plate

Tin cans and super-tankers have more in common than cargo space — the flat steel of which they're made had to be roller leveled. Regardless of the product — cans, cars, planes, appliances or ships — more fabricators will tell you that the "buy-word" in roller levelers is McKay. Write for Bulletin 100, or call for a McKay Application Engineer today.

THE McKAY MACHINE COMPANY
Youngstown, Ohio



McK

SETTING THE STANDARDS OF QUALITY METAL WORKING MACHINES FOR TWO GENERATIONS

STAINLESS STEEL

1/2" O.D. TO

PRESSURE
HEAT EXCHANGER, CONDENSER AND EVAPORATOR —Full Range of Sizes
PRESSURE
PIPING—Complete Range of Schedules. 40, 10 and 5 Sizes
PRESSURE
SANITARY—O.D. and I.D. Polished—For Dairy and Food Processing
PRESSURE
HEAT RESISTANT—Special Analyses 309, 309S, 310, 330
PRESSURE
BEVERAGE—Cut Lengths or 50' Coils

World's Largest Producer of

SPECIALTY WELDED TUBING

Offers Your Most Complete Source of Supply

You can find a tube to fit any requirement in Republic's full quality line of welded steel tubing.

Manufactured at the Steel and Tubes Division, Republic Tubing is welded by the ELECTRUNITE Process . . . a Continuous Electric Weld method that unites the wall under pressure without the addition of foreign or extra metal. Among other advantages this process assures uniformity of wall thickness, strength, ductility, concentricity, diameter and physical and mechanical properties.

Republic, the pioneer in this improved welding technique, is proud of its many "firsts" in the industry. In addition to introducing ELECTRUNITE® Boiler Tubes to the trade more than 25 years ago —plus Electrical Metallic Tubing and Dekoron®-Coated E.M.T. to the electrical industry, Republic was the first to provide a non-destructive electronic production method of testing tubing used for critical pressure applications, known to the trade as FARROWTEST®.

With plants in four locations, we are able to service you promptly with these complete ranges of analyses of carbon and stainless steels for mechanical, structural and pressure uses. A wide selection of sizes for every tube is also available. (See captions.)

Next time you need tubing or electrical raceways, whatever the application, call your nearest Steel and Tube Representative. Or contact us direct. We've solved a lot of problems in 50 years, and we'll be happy to tackle yours. To get descriptive literature, mail coupon at right.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

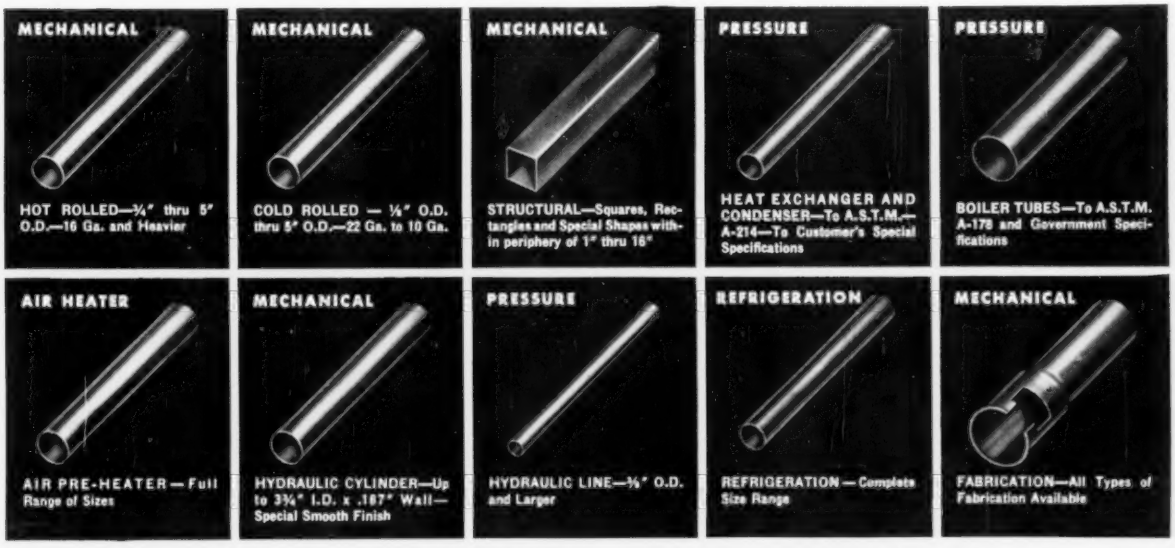
TUBING AND PIPE

40" O.D.

PRESSURE
AIRCRAFT—Exhaust Stacks, Hydraulic Lines and Duct Tubing
PRESSURE
SPECIAL BRIGHT ANNEALED—Up to 4" O.D.—Special Shiny Surface
MECHANICAL
FULL FINISHED—Annealed and Tested for All Mechanical Uses—All 300 Series Analyses
MECHANICAL
ORNAMENTAL—Type 302—Not Annealed—Not Pressure Tested
MECHANICAL
STAINLESS CLAD—Double Wall—Outside Stainless—Inside Carbon

CARBON STEEL TUBING

⅛" O.D. THROUGH 5" O.D.


MECHANICAL
HOT ROLLED—¼" thru 5" O.D.—16 Ga. and Heavier
MECHANICAL
COLD ROLLED—⅛" O.D. thru 5" O.D.—22 Ga. to 10 Ga.
MECHANICAL
STRUCTURAL—Squares, Rectangles and Special Shapes within periphery of 1" thru 18"
PRESSURE
HEAT EXCHANGER AND CONDENSER—To A.S.T.M.—A-214—To Customer's Special Specifications
PRESSURE
BOILER TUBES—To A.S.T.M. A-178 and Government Specifications
AIR HEATER
AIR PRE-HEATER—Full Range of Sizes
MECHANICAL
HYDRAULIC CYLINDER—Up to 3¼" I.D. x .187" Wall—Special Smooth Finish
PRESSURE
HYDRAULIC LINE—⅛" O.D. and Larger
REFRIGERATION
REFRIGERATION—Complete Size Range
MECHANICAL
FABRICATION—All Types of Fabrication Available

ELECTRICAL RACEWAYS

E.M.T. ⅜" THROUGH 2"—RIGID STEEL CONDUIT ½" THROUGH 6"

E.M.T.—⅜" thru 2"—Inch-Marked & Guide-Lined, Inside Knurled in Popular Sizes
RIGID STEEL CONDUIT—ENAMELITE—½" thru 6"
RIGID STEEL CONDUIT—GALVITE—½" thru 6"
DEKORON-COATED E.M.T. A Plastic Armored Electrical Raceway—½" thru 2"
DEKORON-COATED RIGID STEEL CONDUIT—Plastic Armored Conduit—½" thru 6"

STEEL

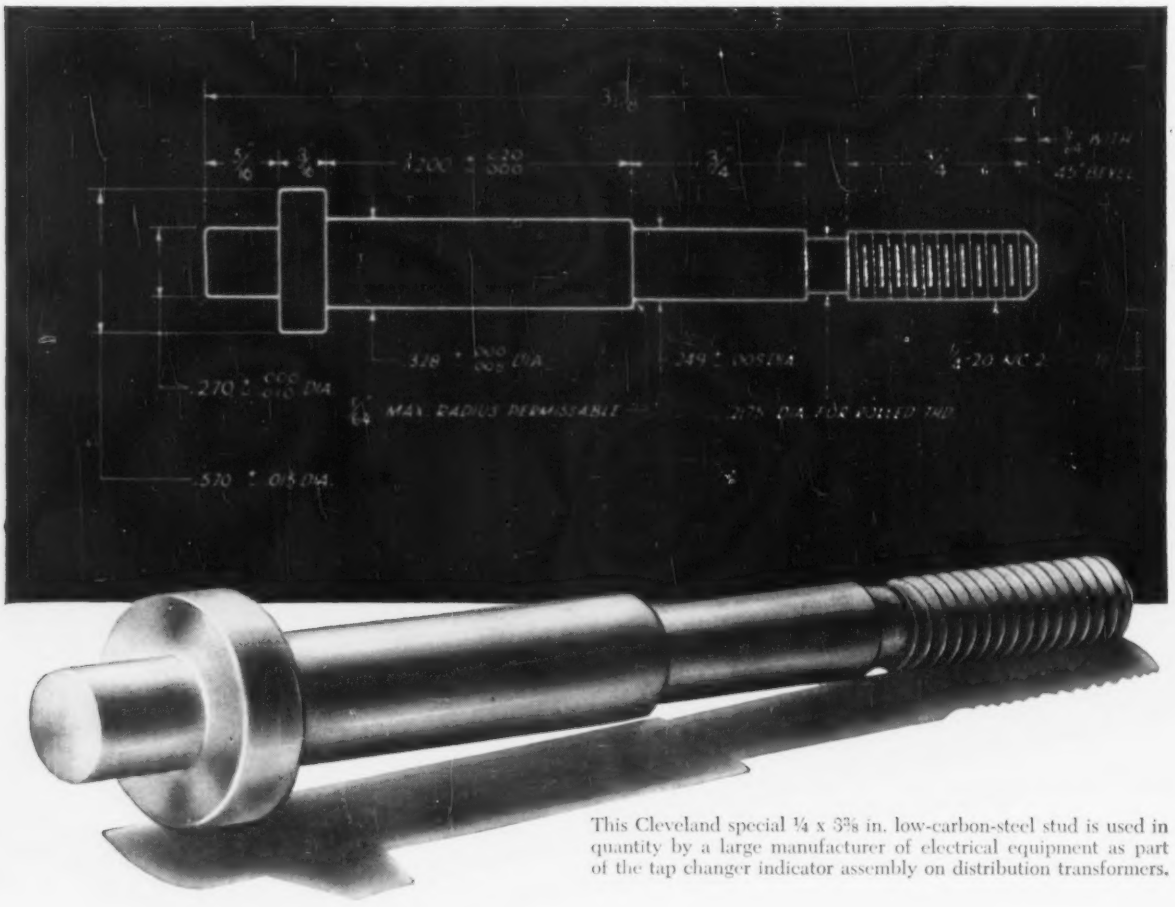
and Steel Products

REPUBLIC STEEL CORPORATION
STEEL AND TUBES DIVISION
Dept. C-2370
216 East 131st Street, Cleveland 8, Ohio

Please send me information on:

☐ Stainless Steel Tubing and Pipe — Type_____.
☐ Carbon Steel Tubing — Type_____.
Electrical Raceways — ☐ Electrical Metallic Tubing
☐ Rigid Steel Conduit
☐ Dekoron-Coated E.M.T.

Name_____Title_____
Company_____
Address_____
City_____Zone____State_____



This Cleveland special ¼ x 3⅜ in. low-carbon-steel stud is used in quantity by a large manufacturer of electrical equipment as part of the tap changer indicator assembly on distribution transformers.

Cost of special collar stud is cut 20% by Cleveland's cold forming techniques

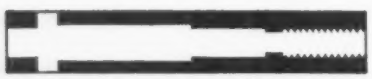
The famous Kaufman Double Extrusion Process which turns out millions of Cleveland precision cap screws yearly is highly adaptable to low-cost production of your fastener-type specials.

The tap changer stud pictured above is typical. Used by a well-known electrical equipment manufacturer, it was previously cut from bar stock. The special head, double shoulders, and groove above the threads meant numerous machining operations and considerable scrap.

Cleveland now cold forms this special stud at 20% less cost to the customer, while holding the specified .005 in. tolerance. And the part is stronger. In the head, threads and fillets, grain flow is symmetrical and unbroken. In addition, the forging action of the Kaufman process toughens surface metal while leaving the core ductile. Both fatigue resistance and tensile strength are thus increased.

We are regularly cold forming close-tolerance specials—many with unusual or extreme upsets—in large quantities. So whether your part is simple or complex, it will pay you to check with Cleveland, particularly at the design stage. There is an excellent chance that through cold forming we can cut the cost and improve the physical properties of the part you have in mind.

• • •



Black area represents metal that had to be cut away when stud was produced by machining. In the Cleveland cold forming process almost all the metal in the working slug is present in the finished part. The customer saves the difference.

Write for a copy of our folder "Specials by Specialists"

THE CLEVELAND CAP SCREW COMPANY
4444-1 Lee Road, Cleveland 28, Ohio

This Whiting Crane at Continental quickly carries heavy coils of wire from storage to production—keeping machines busy without jam-up.

How Continental Steel's "special" cranes pay off!

Continental Steel Corporation, Kokomo, Indiana, depends on three "special" Whiting Cranes to keep production flowing fast. Two of them are 5-ton overhead cranes used to spot coils of wire accurately at automatic wire welding machines, then move the finished reinforcing fabric to shipping or storage. The third Whiting Crane is a low profile gantry with floor level hoisting drive. It moves all production in Continental's pickling department and has played an important part in increasing the company's wire production by nearly 50%. These cranes – like all Whiting Cranes – are "special" because each is custom engineered to do a specific job, day in and day out, with a minimum of maintenance.

WHITING CORPORATION, 15601 Lathrop Avenue, Harvey, Illinois

SEND FOR THIS REPORT

An illustrated 6-page case study, "Custom Built Whiting Cranes for Continental Steel Corporation" tells how these cranes were engineered to solve special problems. Write for a copy today.

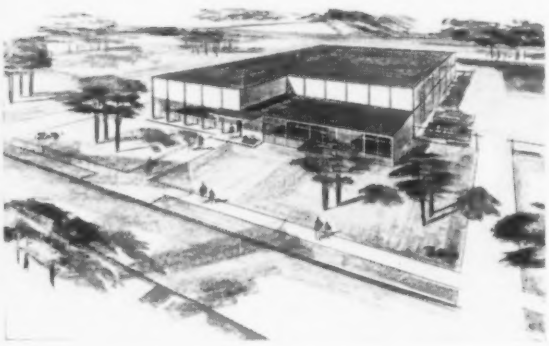
MANUFACTURERS OF CRANES, TRAMBEAM HANDLING SYSTEMS, TRACKMOBILES, FOUNDRY, RAILROAD AND CHEMICAL PROCESSING EQUIPMENT

PENCO NEWS

"SERVING INDUSTRY FOR OVER 40 YEARS"

FROM AMERICA'S LARGEST INDEPENDENT TOOL STEEL DISTRIBUTOR

Peninsular's Services Available To Every Tool Steel User in the Midwest



Peninsular To Expand In Seven Areas

We have retained the architectural firm of Robert L. Svoboda, Detroit, to design a truly modernistic, daylight type of building—to provide both office space and an adequate warehousing area for steel stocks in each of 7 branches.

This expansion program will include office and warehouse projects in Cleveland, Toledo, Dayton, Akron, Indianapolis, Grand Rapids and Buffalo.

Construction of these new facilities is well under way. We have been assured that the entire expansion program will be completed as rapidly as possible, so that we can better serve the Metalworking Industry.

All buildings will be similar in design, and follow closely the design as shown in the above photograph.

Ten Other Warehouses To Serve The Midwest

Peninsular also warehouses complete tool steel stocks in nine other industrial cities in the Midwest:—Grand Rapids, Chicago, Rockford, Indianapolis, Toledo, Dayton, Akron, Cleveland and Buffalo, to serve you.

Now, wherever you're located, in this great industrial area, your tool steel needs can be satisfied instantly, by either the Detroit warehouse, or one of 9 branches.

Peninsular tool steels are just minutes from your plant, and a telephone call will send them on their way. And, we'll gladly help you with any tool steel problems, too.

Detroit Headquarters Office and Warehouse

It's one of the most modern steel warehouses in the entire Midwest. It's designed to serve the tool steel needs of the greater Detroit area, and house the headquarters of the Peninsular Steel Co. You can visualize its size, when we tell you that 3 freight cars can be unloaded, at one time, inside this warehouse, at the far end.

Metallurgical Department To Serve Your Every Need

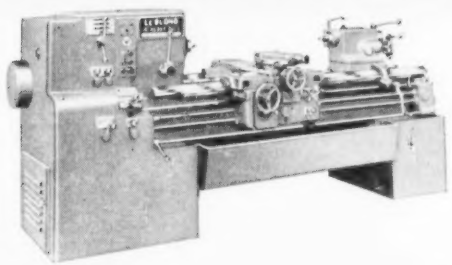
Facilities of our complete Metallurgical Department are available, at our headquarters in Detroit, to serve you. We're constantly analyzing the properties of our various tool steels, and testing them in terms of your specific needs. Mr. George J. Danis, Chief Metallurgist, supervises the activities of our Metallurgical Department.

For further information, write Peninsular Steel Company, 24401 Groesbeck, P.O. Box 3853, Detroit 5, Michigan.

LeBlond's Complete Line of Heavy Duty Engine Lathes

12", 14", 16", 20"

7½ to 40 horsepower

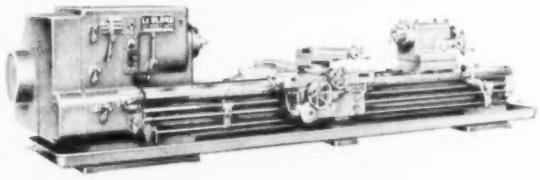


LeBlond heavy-duty engine lathes are known for their outstanding stamina—the ability to stand up to the toughest turning jobs with precision, year after year.

Major features, 16" machine shown: Single-lever, four-way power rapid traverse built into the one-piece apron. Combination gear-belt drive headstock with 27 speeds from 16 to 2000 rpm. Totally-enclosed quick-change box. Hardened and ground replaceable steel bed ways. Automatic lubrication. Write for literature: 12" Bulletin HD-102; 14"—Bulletin HD-112; 16"—Bulletin HD-127; 20"—Bulletin HD-143.

25" and 32"

50 and 60 horsepower

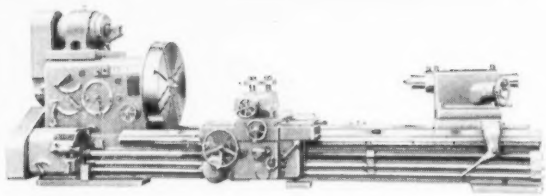


Whether you need high power, contoured shapes or fine finish, LeBlond offers the utmost in dependability, speed and easy operation.

Major features, 32" machine shown: Adjustable acceleration for starting, stopping, jogging provides true safety. 36-speed headstock, spur gear design for the lowest no-load friction horsepower. Four-way power rapid traverse. Generous proportions throughout for long-lived stamina and precision! Write for literature: 25"—Bulletin HD-156; 32"—Bulletin HD-165.

40" and 50"

50 and 60 horsepower



LeBlond 40" and 50" Heavy Duty Engine Lathes are capable of turning anything from giant press columns to small winch drums with equal ease. They are famous throughout industry for stamina, speed and simplicity of operation.

Major features, 40" machine shown: 27 speed geared headstock. Spindle is mounted on four anti-friction bearings. Lubrication is automatic. Other features include totally enclosed quick-change box, one piece apron with six-way power rapid traverse. Thrust lock tailstock, hardened and ground steel bed ways. Write for literature: 40"—Bulletin HD-172-C; 50"—Bulletin HD-182-C.

The R. K. LeBlond Machine Tool Company

Cincinnati 8, Ohio

World's Largest Builder of a Complete Line of Lathes for more than 70 years.

Representatives in principal cities throughout the world.

LEBLOND of Cincinnati

Wheelabrator mechanical descaler for cleaning skelp.

Another example of Steel Industry Savings with Wheelabrator® Mechanical Descaling

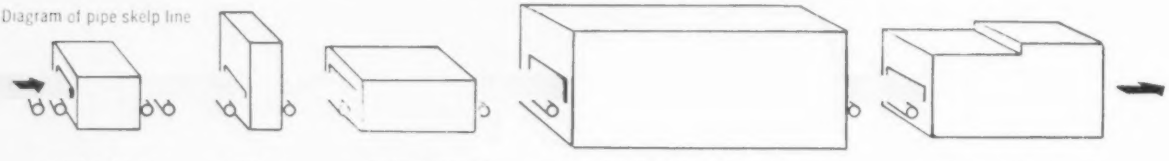
Wheelabrator mechanical descaling equipment, now being used to clean pipe skelp edges, serves to underline the versatility this process holds for the steel industry and shows the high degree of control that can be achieved.

In preparing pipe skelp for electrowelding, only a small strip along either edge of the bottom side of the skelp must be cleaned to bare virgin metal to the copper electrodes. Finish on the surface of the pipe, of course, is not critical.

In Wheelabrator equipment, a blasting wheel is positioned under each edge of the skelp so that the blast pattern is parallel with the length of the skelp. As skelp passes through the Wheelabrator there is fast, thorough cleaning of edges without wasting power or abrasive on areas that do not need to be cleaned.

For information on savings you can make with Wheelabrator equipment in all phases of steel descaling, write today for your copy of Bulletin 128-D.

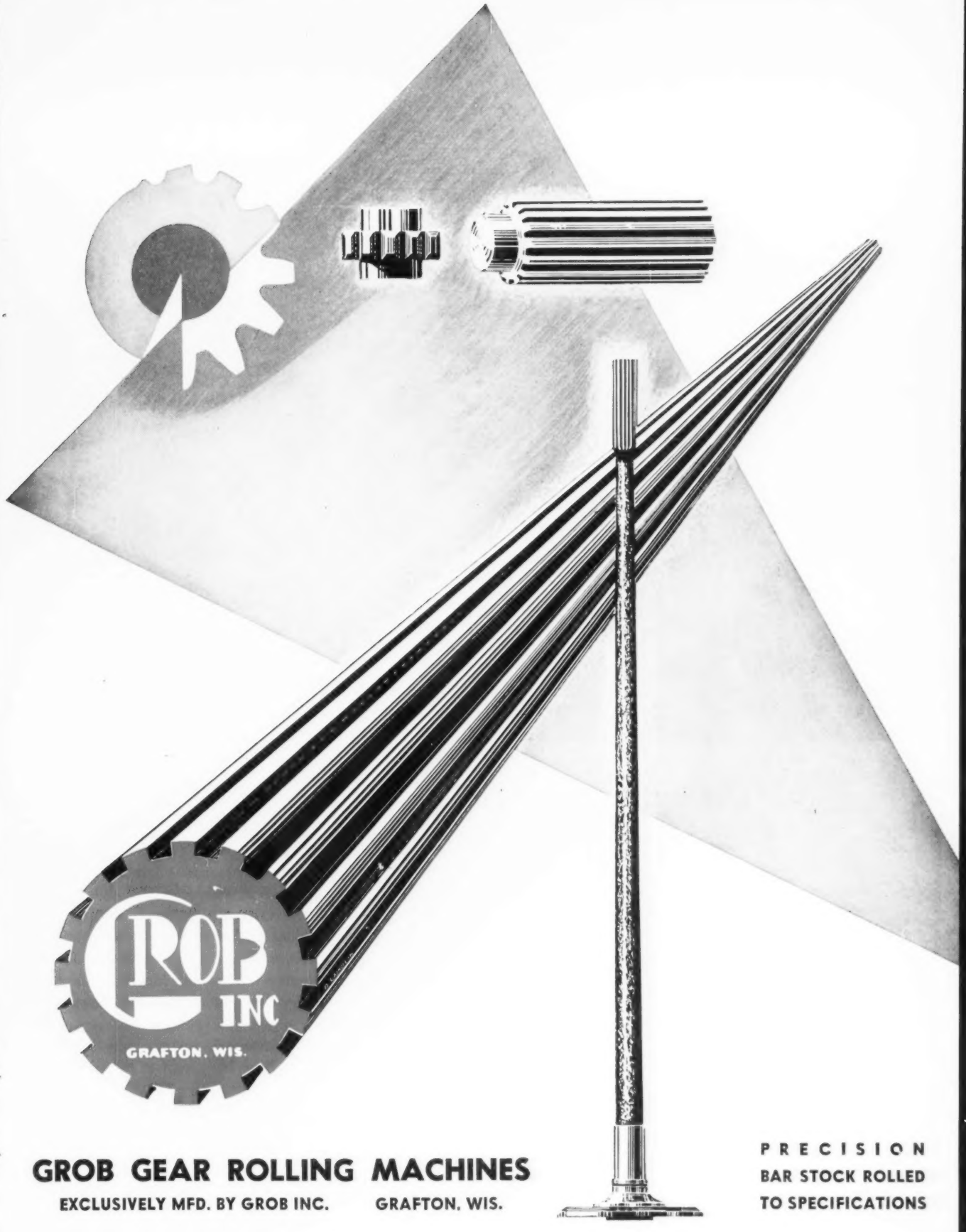
Diagram of pipe skelp line



UNCOILER & LEVELER | SKELP SHEAR | EDGE TRIMMER & SCRAP CHOPPER | WHEELABRATOR EDGE BLASTER | FORMING, WELDING & PULLOUT MILLS

WHEELABRATOR® CORPORATION

510 South Byrkit Street Mishawaka, Indiana

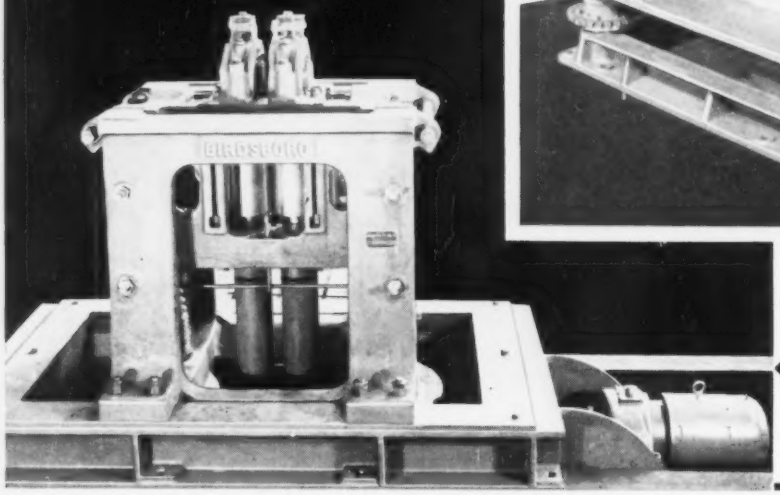


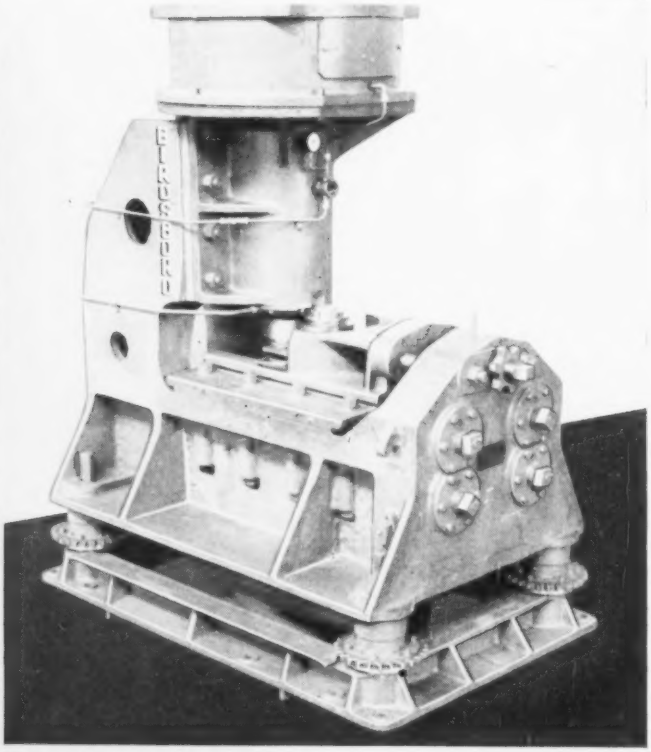
GROB GEAR ROLLING MACHINES

EXCLUSIVELY MFD. BY GROB INC. GRAFTON, WIS.

PRECISION
BAR STOCK ROLLED
TO SPECIFICATIONS

design versatility...





▲ VERTICAL MILL with twin motor drive, one motor above the other. Rolls are short sleeves.

◀ VERTICAL MILL with full length roll bodies driven by universal spindles from below. Pinion stand and bevel gear drive are located below the mill.

Design Versatility — BIRDSBORO's Key to New Gains in Mill Productivity for You

It takes job-designed equipment to make the production increases needed by every mill operator today. It's not enough to replace or build new machinery, but each piece must be perfectly designed to supply the full potential of the mill. The industry-wide scope of the Birdsboro staff provides versatility of design ideas that result in "customized" work. The examples pictured show two vertical mills of different design. Each is specifically designed for its application. Your Birdsboro representative can tell you about the special advantages of these and many other special pieces of equipment. Main office and plant: Birdsboro Steel Foundry and Machine Co., Birdsboro, Pa., District Office: Pittsburgh, Pa., Subsidiary: Engineering Supervision Co., 120 W. 42nd St., New York 36, N.Y.

MM60-57

BIRDSBORO
STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES (Metalworking and Extrusion) • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel

Change motors in minutes—

with FALK *all-steel* MOTOREDUCERS

OUT COMES OLD MOTOR ⬆

IN GOES REPLACEMENT MOTOR ➡

No long and costly "down time" involved

Motors can be interchanged or replaced *in minutes* with the all-steel, All-Motor type FALK Motoreducer. No long and costly "down time" is involved in making the change!

Best of all, replacement is not limited to original make of motor—new NEMA frames may be substituted for old. This versatile Motoreducer operates with any make, speed or type of standard foot-mounted motor within its AGMA rating. No modification, no special shaft, no "partial" motor required.

In addition to unmatched motor interchangeability, this dependable gear drive—the "work horse of industry"—offers: widest choice of output-shaft position (horizontal, vertical, right-angle)...any output-shaft connection...any mounting, including wall and ceiling...standard speed range from 1.5 rpm to 1430 rpm. All these advantages, plus proved efficiency, low maintenance and extra-long life, make the All-Motor type FALK Motoreducer your best buy for any job requirement.

Furnished in sizes up to 75 hp with any make, style or type of motor; or, *without a motor if desired.* FALK Motoreducers are available from convenient factory, field or distributor stocks, from coast to coast.

Write for Bulletin 3100

THE FALK CORPORATION, MILWAUKEE, WISCONSIN

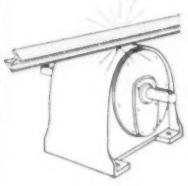
MANUFACTURERS OF:

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

FALK

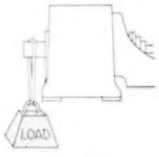
...a good name in industry

FALK "IN-BUILT" FACTORS assure full dependability—better service—longer life



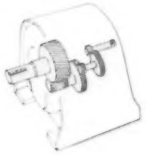
ALL-STEEL HOUSINGS

Rugged, strong, rigid ...all parts heavy steel plate, formed and welded in the Falk Weld Shop.



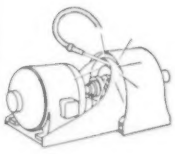
LARGE OVERHUNG LOAD CAPACITY

Large shafts, oversize bearings...rigid mountings with wide bearing spans to handle maximum loads.



PRECISION GEARING

Heat-treated alloy steel gearing, precision cut and shaved after heat treatment to eliminate distortion.



SEALED HOUSINGS

Splashproof, dustproof, oiltight. Dual closures and one-way vents keep oil in, dust and moisture out.

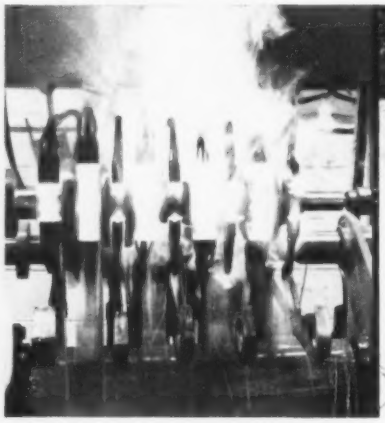
Case Studies:

NONDESTRUCTIVE TESTING SYSTEMS

On-the-Spot LEAK TEST

New Zyglo Portable Kit provides the most convenient and sensitive leak tests, on-the-spot and in-place. For process tanks, liquid lines, tank weldments during fabrication, on cast housings, etc. Just spray Zyglo Penetrant on one side, as in this weld test.

And find the leak! The supersensitive Zyglo-Pentrex ZL-22 quickly penetrates through faulty weld and shows as brilliant glow, looking at other face of weld under Zyglo Kit's black light.



Hardening crankshaft bearings with flame heat treating at National Induction Heating, Inc., Hazel Park, Mich.

Before and after heat treating, automotive crankshafts are inspected with Magnaglo for cracks.

How Nondestructive Testing Backs Unconditional Guarantee of Heat Treating

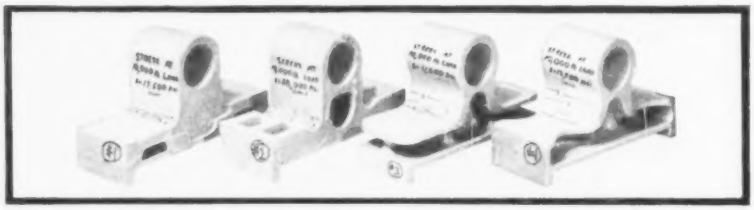
Backing up heat treating service with a 100% customer guarantee takes tight control—especially when the parts treated are critical, for planes and tanks.

Testing with Magnaflux-Magnaglo® makes such a guarantee entirely practical for National Induction Heating, Inc., of Detroit. Parts are tested *before* and *after* heat treating, since treatment may release stresses around inherent defects or produce thermal cracks in previously sound materials. Either way, Magnaflux-Magnaglo will find the defects!

Initial tests are made on "green" stock and on the first few treated parts to minimize scrap losses. If significant flaws or cracks are detected, the cause can often be corrected by slight changes in design or heat treatment before the full run is processed. This means real savings for customers.

Magnaflux Testing Systems, using many various methods, are reducing costs in hundreds of in-process operations—at all stages of production. Wisely employed to find serious cracks early, they save time, labor and dollars which are otherwise wasted in working parts fit only to be scrapped. With Magnaflux' positive detection, *you* decide which defects are serious and how to correct them. You never need pass a bad part, or scrap a good one for harmless imperfections. *Result: Consistent quality levels at lowest cost to you.*

For further information on the many ways you can save money with Magnaflux Testing Systems, please write today for our booklet, LOWER MANUFACTURING COSTS.



STRESS ANALYSIS BRINGS STRONGER, LOWER-COST CASTING

Using Magnaflux' Stresscoat brittle coating for experimental stress analysis, foundries now suggest design improvements which reduce cost and improve the product. In this typical case, the original casting, a truck fifth-wheel support, #1 (at left) required three complex sand cores, was expensive, had high stress concentration. Two intermediate designs, analyzed with Stresscoat, led to the new standard part, #4 (at right). It is 9% cheaper, 15% stronger, and much easier to pour. The result: Better castings and new business for the foundry.

THE HALLMARK OF QUALITY IN NONDESTRUCTIVE TEST SYSTEMS

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Write for complete details concerning any of the above case studies, or ask for our new booklet on Lower Manufacturing Costs.

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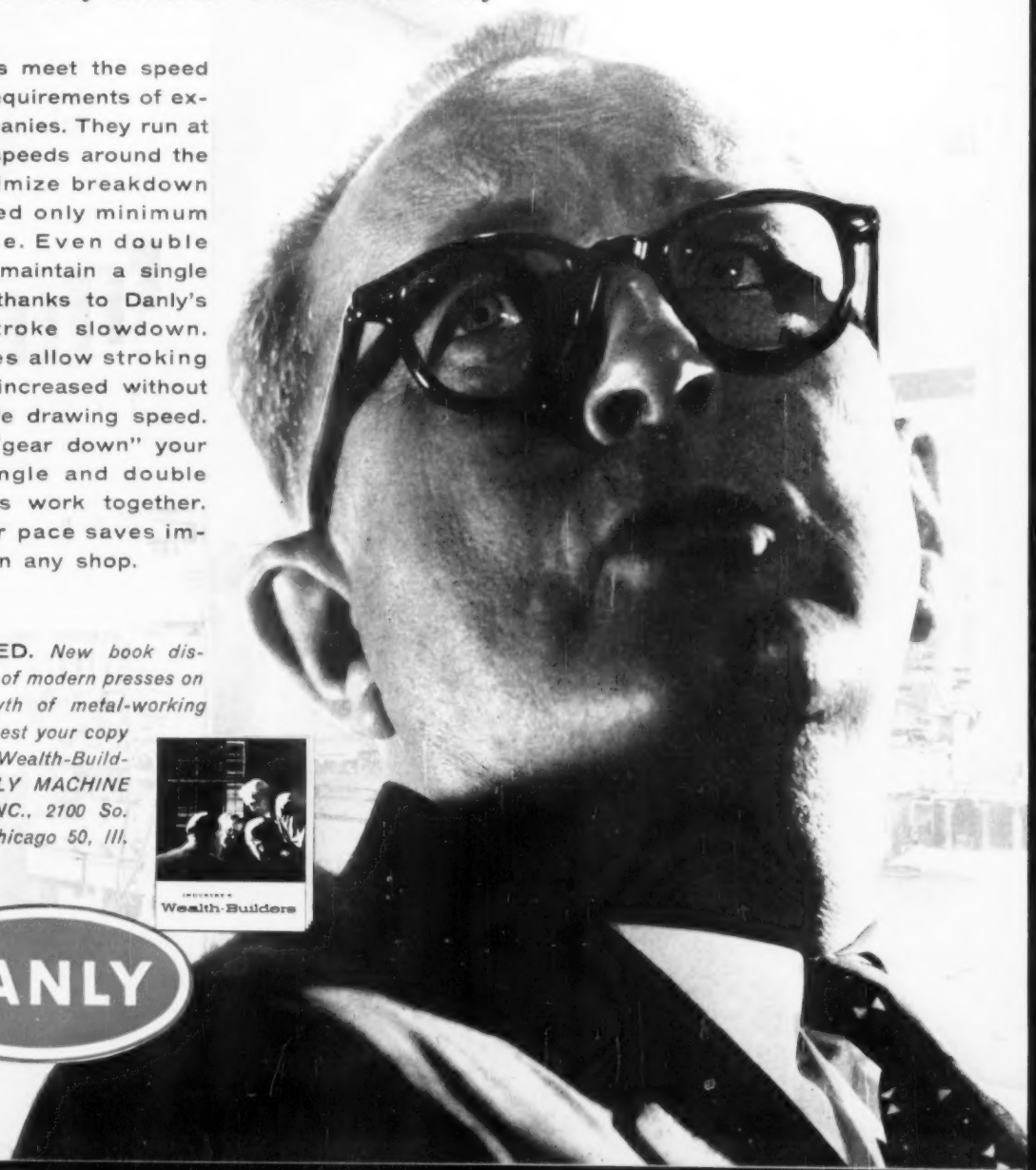
get the speed they need for "on time" delivery

Danly Presses meet the speed and volume requirements of expanding companies. They run at top stroking speeds around the clock . . . minimize breakdown delays . . . need only minimum maintenance. Even double action types maintain a single action pace, thanks to Danly's controlled stroke slowdown. Special drives allow stroking speed to be increased without exceeding safe drawing speed. No need to "gear down" your line when single and double action presses work together. Danly's faster pace saves important time in any shop.

JUST PRINTED. *New book discusses the effect of modern presses on profits and growth of metal-working companies. Request your copy of "Industry's Wealth-Builders" from DANLY MACHINE SPECIALTIES, INC., 2100 So. Laramie Ave., Chicago 50, Ill.*



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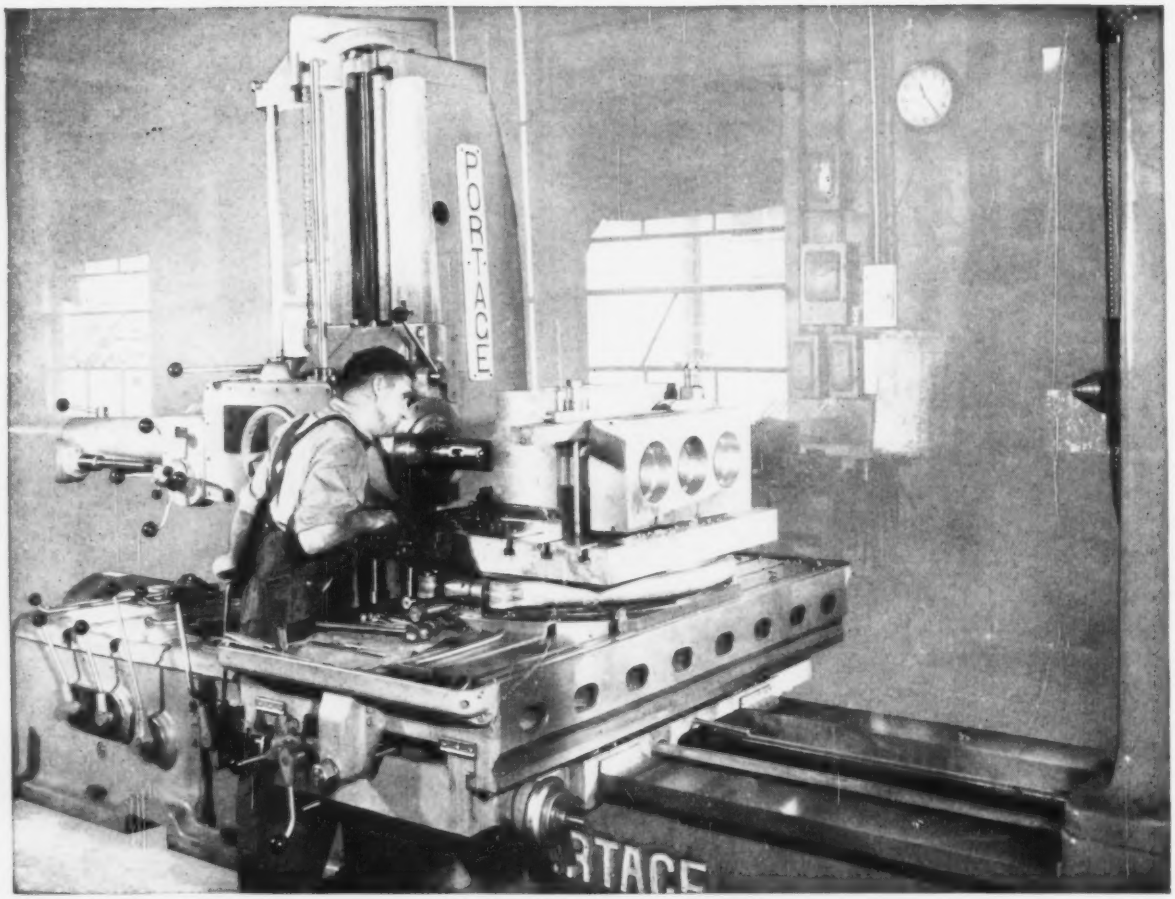

Photo courtesy 20TH Century Mfg. & Supply Co., Tulsa, Oklahoma

"We are extremely proud of the job our PORTAGE mills are doing"

The Portage Machine Co.
Akron, Ohio

Gentlemen:

Our business, as you know, is Contractors of Metal Products. This particular job is a steel forging being machined, and when finished will be a fluid cylinder for a high pressure pump used in the oil industry. These forgings are made from AISI-4140 steel and we are extremely proud of the job PORTAGE mills are doing.

We find our PORTAGE mills very accurate. These mills must repeat themselves in each location and operation often during the machining operation. Specifications call for very close tolerances and we have no trouble in doing this precision work.

Yours truly,
20TH Century Mfg. & Supply Co.

R. G. Galloway
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B&W Silicon Carbide Refractories for metal-working furnaces

To meet the specialized requirements of the primary metals industry, B&W manufactures Silicon Carbide Refractories in a variety of shapes and sizes. These durable refractories are produced in B&W's Augusta, Ga., works to the same rigid quality control standards used in making all B&W Refractories. See your local B&W Refractories Engineer for further information.

B&W Silicon Carbide Rolls

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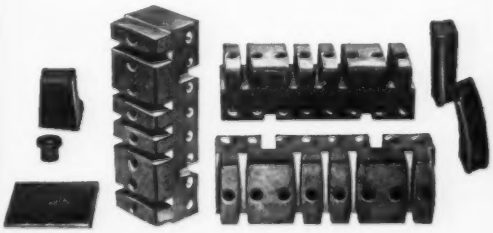

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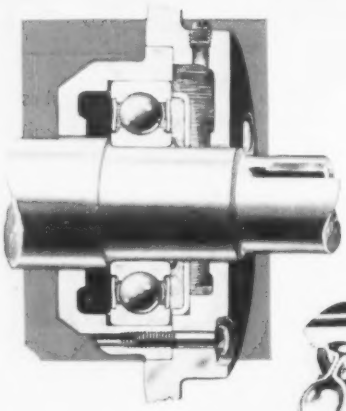
FACTS

about

NEW DEPARTURE BALL BEARINGS

Photo: Courtesy of Reliance Electric and Engineering Company



Metering plate adjacent to bearing prevents overlubrication. Excessive grease pressure is relieved outwards around shaft. No grease can be forced into motor.

Right: Shielded ball bearing always retains adequate grease supply.

Driving a car shaker is like riding a bucking bronco—and the motor and bearings that do the job have *got to be* tops in every detail for such rugged service.

But even under these rough, tough load conditions, high capacity New Departure ball bearings assure exact rotor location—full electrical and mechanical motor efficiency.

An important feature of the bearing mountings is the use of a "metering plate" which regulates grease flow and prevents excessive grease pressure against the bearings. They cannot be under- or over-lubricated. Yes, motor and bearings are built to maintain precision at operating extremes.

Such motors are safe for long periods without attention—the bearings are fully protected from dirt and there is no grease leakage into the windings. Write for details on New Departure shielded ball bearings.

VISIT NEW DEPARTURE AT THE DESIGN ENGINEERING SHOW, COLISEUM, NEW YORK CITY, MAY 20-23, 1957, SPACE 1240

SEE "WIDE WIDE WORLD" SUNDAYS—NBC-TV

BALL BEARINGS MAKE GOOD PRODUCTS BETTER

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONN.

Hot Paint Spray for Cars

Look for the automobile industry to make significant progress in the use of hot spray painting. While the process is not new, recent technical developments have led cost-conscious automakers to view it with renewed interest. Reports indicate that the technique yields high-quality finishes together with important savings in manpower and paint cost.

Standardize Punched Cards

The lack of uniformity in punched cards and tapes is a problem the British intend to do something about. British Standards Institution has set up a committee to insure that blank cards or paper tape will fit any make of punching machine, computer or machine tool. Three subcommittees will tackle such questions as: (1) physical dimensions of cards, (2) a standard form of coding, (3) present variations in punched tapes.

New Test for Sealed Parts

A new nondestructive test technique helps control quality in the production of hermetically sealed electronic parts, magnetrons, vacuum tubes and small fuel tanks. Parts are placed in a tank containing a gas charged with radioactive particles. When parts are removed, they are checked with the usual devices to see whether they absorbed any radioactive molecules.

Superalloys Save Nickel

High production rates of military and commercial aircraft gas turbines will necessarily boost the use of nickel-free superalloys, some observers feel. For service in the 1000-1500°F range, certain iron-chromium-manganese alloys look good. They show properties comparable to those containing large amounts of nickel and other costly, critical elements.

Cold Working Helps Welds

Continuous, uniform cold working of welded joints by a process called "roll planishing" is said to improve their tensile strength and ductility significantly. Need for the process was dictated by the fact that increasingly complex welds make it harder to get 100 pct joint efficiency. Claim is that even with proper application of the welding torch or electrode, joint efficiency is only 80 to 90 pct. The cold-working process makes up the strength deficiency.

New High-Heat Lab Tool

A new research tool will produce and control temperatures up to 26,540°F—hotter than the surface of the sun. It's an adjustable gas jet using various noble gases which are highly ionized by an electric charge. Length of the flame can be varied between one and six inches, depending on requirements. The jet, which can be adjusted to many positions, is free from contaminants.

Static Controls Favored

One grinder manufacturer seems about ready to apply static control elements to its line of standard machines. Prototype units so equipped have been free from control panel maintenance problems for two years. Big appeal in these sealed, plug-in type elements is that they have no moving parts to wear out, or otherwise get out of order. More and more machine tool builders are experimenting successfully with static controls.

Radiographs In a Hurry

A multiple film technique speeds industrial radiographic inspection of parts with sections of varying thickness. The idea is to make a single setup and a single exposure, but to use two or more films of different radiographic speeds. The slow speed film records thin sections; the faster films picture the thick sections of the specimen.

BDSA Won't Die

Important divisions of the Commerce Department's Business and Defense Services Administration will be continued. Although House Democrats took a crack at the Commerce Dept. by knocking out funds for BDSA, they assumed the Senate would put the money back. There is virtually no possibility that BDSA, last remnant of detailed government control over industry, will be allowed to expire.

Millroom in Atlantic Steel's new plant. In the right foreground you see the Cleveland unit which serves as Kick-off Drive on the Shear Discharge Table.

8 CLEVELAND drives equip new DIXISTEEL TRADE MARK bar mill

ONE of the finest, fastest, most versatile of the recent additions to America's steel processing facilities is a new 13" merchant bar and rod mill at Atlanta, Georgia. In operation since last November, this mill produces rods, rounds, flats, angles, channels and light sections of various sizes under the well-known name of Dixisteel, trademark of the Atlantic Steel Company.

Power transmission equipment includes another famous name product—Cleveland Worm Gear Speed Reducers—of which 8 heavy-duty units are employed as drives on the mill discharge table and cooling bed carry-over.

Whenever drives must handle heavy loads under difficult conditions—efficiently, economically, continuously, dependably—industry chooses Clevelands. There are models to meet every requirement, wherever a powerful right-angle drive is preferred. To see the complete line, write for a copy of Bulletin 145—just off press.

The Cleveland Worm and Gear Company, 3282 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers, Limited.

CLEVELAND
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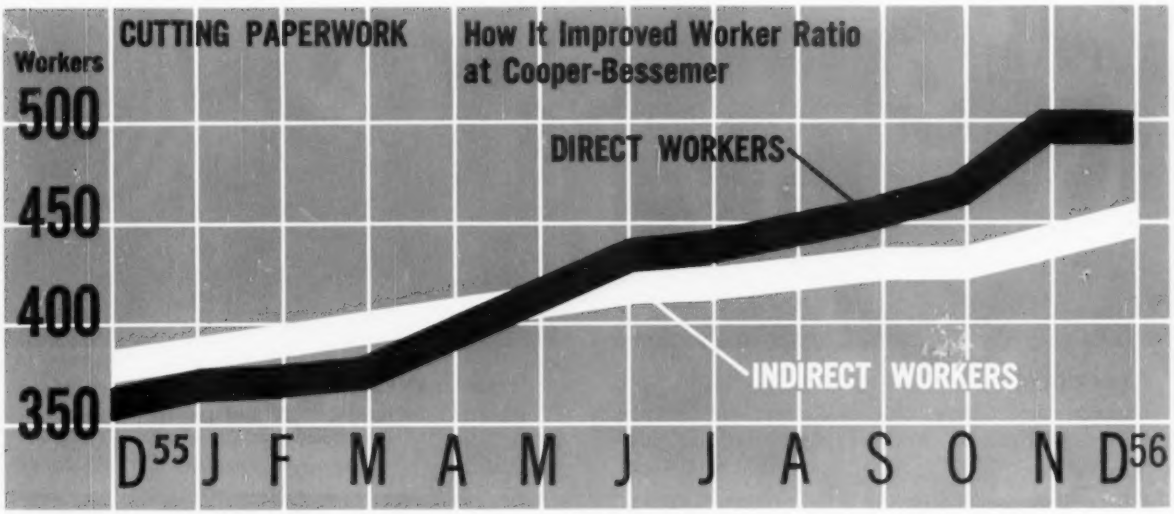
Speed Reducers



A Streamlined Program Can Trim Your Paperwork Load

Cost-Saving Bonus Rewards the Effort

Companies are beginning to learn they have been hampered for years by needless paperwork.

A few unnecessary forms here and there can cost thousands of dollars annually.

What Cooper-Bessemer and Rotary Electric Steel did may serve as a model for others.

■ During the next three years, U. S. business is expected to spend a minimum of $1 billion to modernize office procedures.

According to W. Walter Finke, president, Datamatic Corp., at least 1000 organizations "are losing money every day they struggle to stem the mountainous tide of paperwork with obsolete equipment . . . and procedures."

An outstanding example of how one company stemmed the tide is Cooper-Bessemer Corp., Mt. Vernon, O., which began a sweeping reform in paperwork last year. To date, the reform has eliminated more than 1.3 million pieces of paper, freed 39 clerical workers for more productive jobs, and racked up savings conservatively estimated at $175,000.

Speeds Operations—In a force of about 800, where indirect workers had outnumbered direct production workers, cutting out unnecessary paperwork reversed the ratio.

On the operations side, off-the-shelf replacement parts orders now go out the same day rather than a week later. Intermediate level executives are freed of hours of paperwork daily. Production and scheduling men get up-to-date information in two days rather than weeks later.

Top-Level Support — This all came about solely by streamlining procedures. More economies may be expected if the company decides to install integrated data processing equipment.

It wasn't easy to put the streamlining program across. Full backing by Cooper-Bessemer President L. F. Williams was required to pry employees away from the old way of doing things.

The basic problem was that over the years many departments had built up their own systems of operating. Thus, a single piece of work going through the shop had clerks

TELETYPE SETUP: Rotary Electric Steel Co. speeds sales orders with wire service.

WORK-SAVER: In one typing, sales data is recorded on hard copies and punched tape.

from a half dozen departments keeping daily tab. There was no attempt to make more than one use of a single piece of paper.

Drastic Steps Taken—Like most sweeping reforms, it took a crisis to start the ball rolling. Last summer Mr. Williams was shown four small bolts and two cork gaskets (see cover) ordered as replacement parts. To handle the order—worth about 15c—there were 67 sheets of paper and files. Officials could only guess the money lost handling the order.

To reverse a trend like this takes drastic steps. A new systems and procedures manager was put in charge. An experienced man from each of six major departments was assigned to a committee headed by the controller.

Policing Is Important—Two engineering co-op students from the University of Cincinnati assisted in research and setting up procedure flow charts. When the drive was started, a daily check was kept by the front office on the number of pieces of paper being saved per week to prevent the program from bogging down.

A policing system was started to prevent resumption of some forms. On occasion, top official pressure was needed to make reluctant-to-change major executives conform.

The normal mechanics of the program have been developed as follows: The department to be checked out is visited by researchers who obtain samples of all paperwork originating there and the distribution list of each.

READY TO GO: At Rotary's shipping dock, packing orders are received automatically over tape-operated teletype system. The setup has cut clerical detail at the shipping dock, speeded processing 600 pct.

New Forms Designed—From this information, a graphic flow sheet is worked out showing where all the copies go. This includes authorization, scheduling, expediting, procurement and materials handling. Recipients are then checked to see what the record is used for and whether, in fact, it is of any use.

After all the information was gathered, simplified flow charts were worked out for each department. The paper savers then held department meetings to set deadlines for starting new forms and distribution lists. It might be noted that the clerical union cooperated with the program.

Three Copies Only—Under the new system, a small card or tag accompanies a job through the shop. Job information can be obtained

from a single central group of expediters and follow-up men. The whole flow is also subject to rigid centralized material control.

Stimulates Morale—Aside from the savings in labor, filing space, and paper and printing costs, Cooper-Bessemer feels the program is paying off in intangibles. Morale among the office workers is stimulated. And now they have a clear approach to suggested improvements in paperwork systems.

While streamlining procedures is a big step forward in record-keeping economy, use of mechanical and electronic equipment can bring added savings and more speed.

Rotary's Story—Rotary Electric Steel Corp., Detroit, recently doubled its workload, yet reduced its order processing time from 12 to two hours, by adopting a Teletypewriter system.

The clerical staff was waiting and ready when the company converted an important portion of its output to producing stainless steel bars, which more than doubled orders received within a year.

New procedures were worked out for order-entry, shipping and invoicing. An integrated data processing system was developed linking Rotary's district offices, its central office, and shipping dock.

Workload Reduced—The system provides a single typing of basic order information at the place of origin. Punched paper tapes reproduce the basic data automatically whenever needed.

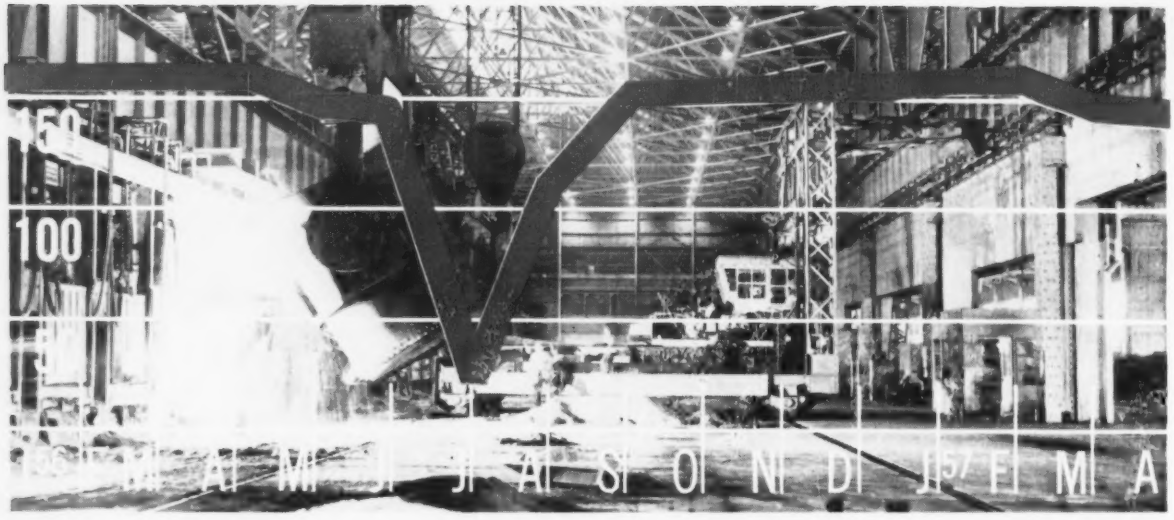
When the system was inaugurated, two people were added to the existing office staff to form an IDP Center staff of seven.

Said Donald Rohberg, Rotary's controller: "We believe we can double our order volume again under this setup and require only the probable addition of one employee."

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

AUDIO-TIMEKEEPING: Worker at General Electric's Metallurgical Products Dept. checks in on new job by using a call box. His words are registered on a master control board at central timekeeping office. He repeats this procedure every time a work change occurs during the day. At shift's end, his hours are automatcially balanced.

TALLYING WAGES: Working fast as a radio network, the central office—manned by seven girls around the clock—collects called-in data on keypunched cards, integrating it with a marked tabulating card. GE estimates the system has saved $36,000 its first year, plus many man-hours and floor space.



Charting Steel's Production Rate

Index: 1947-49 = 100. April 1957 = Estimated. Source: American Iron and Steel Institute.

Look for Steel Pickup in Fall

Demand for plate, structurals, and pipe will bridge gap until flat-rolled market strengthens.

Possibility of auto strike in '58 will force Detroit to build car stocks later this year.—By Tom Campbell*.

■ There will be no recession in steel output this year. Demand for heavy steels will bridge the gap until auto steel requirements pick up this fall.

Current lethargy in steel is only noticeable because the steel rate is down from the 96 to 98 pct levels which existed last fall and earlier this year. The steel rate will average about 88 pct for the second quarter, as compared with 96 pct in the first quarter.

Behind Market Drop — From the short-term view, there will be no serious decline in steelmaking. Demand for flat-rolled steel will leave a lot to be desired until at least late August or early September. The easier tone in steel at the moment is due to the sharp and drastic inventory reduction being made by automakers, by appliance manufacturers, and by builders of homes. The "correction" is about ended.

You can look for a sharp pickup in steel demand after Labor Day. This is because auto makers will be in the market for big tonnages of sheet, strip, terne plate, stainless steels, and bars.

Auto Labor Angle — An added reason for the expected surge in buying by automotive is the possibility of auto labor trouble. New contracts must be signed before June 1 next year. Demands from labor, involving shorter hours and more pay, will be hard to meet.

Because of the chance that labor troubles might flare up, automakers will have to see that their dealers are loaded with cars. This is in case a showdown results in a shutdown of one of the three large makers, or all the "big three" automakers.

A Look At '58—Looking ahead to 1958, steel output will be heavy in the first and second quarters. But it will slow up in the summer months after the settlement—with or without a strike—of the auto pattern.

But late in 1958 and early in 1959, steel users will be faced with the probability of a steel strike and higher steel prices. That prospect will probably step up the inventory-building of steel during the early part of 1959.

Labor Trouble In '59? — It is not at all certain that the next steel contract will be for three years. With the auto union set to fight for a two-year contract, there is a chance that unions in general may change their ideas on long-term contracts. That would spell trouble in 1959.

You can look for a big auto year in 1958; a sharp rebound in private housing activity after a slump this year; a resumption of appliance buying, and a better farm spending pattern.

*Condensed from talks before NIAA and steel warehouse groups.

National Steel Head Steps Down

At 81, Weir Retires as Board Chairman

Steel industry will feel the gap as its chief dissenter leaves active duty.

Millsop is chief executive, Humphrey is likely to be named board chairman.

▪ Steel's No. 1 lone wolf is about ready to call it a day. After 60 years of standing alone against trends, people, and organizations, Ernest Tener Weir is moving into partial retirement.

On May 16 he will step down as board chairman and chief executive officer of National Steel Corp. Thomas E. Millsop, president of National Steel, is slated to become chief executive. A new board chairman will be named next month.

Humphrey Likely Chairman—It's a sure bet that Treasury Secretary George M. Humphrey, who formerly directed the M. A. Hanna coal, iron ore, and shipping empire, will take over as chairman of National. Mr. Humphrey is expected to retire as treasury secretary in the near future.

M. A. Hanna and National Steel have worked closely for years through investments. When Mr. Humphrey steps into the National Steel hierarchy, these two companies will be in a position to exert an even greater influence on the steel industry.

Mr. Millsop, a hard-hitting shirt-sleeved executive, started out as a riveter with a tank car company in Sharon, Pa. He went to work as a salesman for Weirton Steel in 1927. Nine years later he became president of the company and held that post until 1954 when he was named president of National Steel and vice chairman of Weirton.

A Fighter—Not for nothing has Mr. Weir been called "the lone wolf." He has locked horns with steel moguls, labor chiefs, government officials, and editors. Seldom has he come off second best.

His sense of humor is superb. Some years ago, IRON AGE's Tom Campbell was interviewing Mr. Weir in New York. During the conversation, Campbell said something about business men touring Europe for a few weeks; then returning as European "experts." As the interview ended, Mr. Weir said with a chuckle, "So long, Tom, I'm leaving today for a three-week tour of Europe."

How He Did It—Mr. Weir is also the symbol of free enterprise. He carved National Steel out of other steel firms' customer lists, concentrating on sales of tinplate and other flatrolled products; weathered the depression and wound up as one of the industry's elder statesmen.

Mr. Weir will keep a hand in National Steel affairs. He will serve as a director, providing "advice and consultation." But at 81, and after a period of poor health, he is giving up leadership of the company he founded.

Birth of National—In 1929, Mr. Weir brought together Weirton Steel Co., Great Lakes Steel Corp., Hanna Iron Ore Co., and Hanna Furnace Corp., to form National Steel Corp. Since then, National Steel's assets have grown from $120 million to nearly $700 million. It is No. 5 among the nation's steel producers. It has been a consistent high money maker.

There was never much doubt about where Mr. Weir stood on leading questions of the day. He was particularly outspoken in matters of labor relations, and was one of the few men who fought the powerful United Steel Workers to a standstill—at least at his Weirton plant.

E. T. Weir

Thomas E. Millsop

George M. Humphrey

Get Full Use From Research Dollars

How It's Done — Obtaining production dollars from research test tubes requires technique. Here are some capsule indications of how companies do it, as revealed by the National Industrial Research Conference:

Borg-Warner — maintains an advisory planning committee whose main job is studying new markets, checking on products that the firm could profitably produce for its markets.

In addition, central advisory boards meet once each quarter and review research programs in progress to determine if they should be changed, expanded or cut off. B-W believes management must set objectives and decide what lines of business should be pursued. Management must control research . . . see that information flows freely between company departments.

Stewart - Warner — reinvests 4-5 pct of its sales income in research and engineering . . . bases division budgets on a percentage-of-sales formula, depending on market potential for products made by that particular division.

Kaiser Aluminum & Chemical Corp.—keeps research men in direct contact with customer problems through an "industry section" of the sales force.

Johns-Manville — keeps research practical by requiring a "market and sales analysis" sheet for each new product idea.

Minneapolis - Honeywell — avoids pulling research men off deadlined projects by assigning a special squad to do short notice, emergency jobs.

Companies agree that research is part of a firm's daily life, must know about corporate problems and get suggestions from other departments. If it's not getting into the company swim, good sales dollars go down the drain

Operations Research Serves All

Management problems are licked by the same methods whether company is large or small.

Here are the primary tools for solving them and the results achieved.

■ You don't have to be an industrial giant to benefit from Operations Research. Smaller companies, too, can derive real benefits from the application of organized scientific methods and new techniques to their operations, stresses R. Pat Crouch, supervisor of Operations Research for Ernst & Ernst, New York accountants and consultants.

Something Borrowed — Since management problems basically are much the same, regardless of company size, smaller companies can often benefit from a low-cost carryover of solutions developed and applied by larger firms. Solutions can be modified or simplified.

Primary tools of Operations Research are mathematics and more scientific methods, but researchers also use specialized techniques such as probability theory, statistics, accounting, calculus, mathematical programming, psychology and industrial engineering. Experts are a must, warns Mr. Crouch. One approach is to hire an experienced operations researcher to work with company personnel. Another is to retain a management consulting firm with such specialists on its staff.

Problem Jackpot — To illustrate Operation Research applications in a smaller company, Mr. Crouch synthesized the XYZ Co. from case histories. This hypothetical firm manufactures a variety of related products with seasonal demands. Products are made in a central factory, shipped to regional warehouses and then to distributors. Aware of recurring management difficulties, the company called in O.R. personnel to solve these major problems:

Accurate sales forecasts.

Optimum inventory levels.

Production which is stable and yet flexible enough to maintain optimum inventory in relation to sales.

Relation of production cost to production volume and marketing cost to sales volume.

Sales and promotion quotas.

Effective incentive plans.

Charting the Course — After study, researchers built profit-volume curves for XYZ's major products and product groups. Production and selling costs were mathematically predicted for a selected range of sales volumes. After ranking products in order of profitability, comparisons were drawn between actual and optimum sales. Optimum product mixes were then developed.

Finally, with a knowledge of product profitability, optimum product mix and potential markets, the company was able to review its employee compensation and bonus plans. As a result, incentive plans were adjusted to tie in more closely with the profitable products.

Atomic Power Goes "Portable"

Army Unveils First Package Power Reactor

Metalworkers play major role in building package power plant prototype.

"Oil drum" of nuclear fuel will replace 40,000 bbl of fuel oil for remote-base operations.

Commercial possibilities for many areas where conventional fuel costs are high.

▪ More than 100 suppliers, most of them in metalworking, helped build the Army's new Package Power Reactor. The 2035-kw plant dedicated this week at Ft. Belvoir is a prototype. Idea is that components of future plants of this type will be flown to remote bases.

It would take about 6 months to assemble this "portable" reactor at a remote base—but all of its nuclear fuel would fit in a 55-gal oil drum. This would end the supply problems involved in shipping 40,000 bbl of fuel oil to the base every year. For that is the amount of oil the nuclear fuel replaces yearly. The "barrel" of nuclear fuel would run the plant for a year and a half.

The Builders—Suppliers to Alco Products, prime contractors, included makers of pressure vessels, instruments, piping, pumps, valves, turbines, condensers, fuel elements, and a host of other "hardware" items.

When Alco landed the contract in December 1954, it was low among 18 bidders. It will get about $2.5 million for the job, which is perhaps $1 million below its actual cost. Significance here is that Alco management knew when it submitted the low bid that it was "buying" the contract. What it bought, in addition to prestige, was experience in building plants of this type —experience which could be had in no other way.

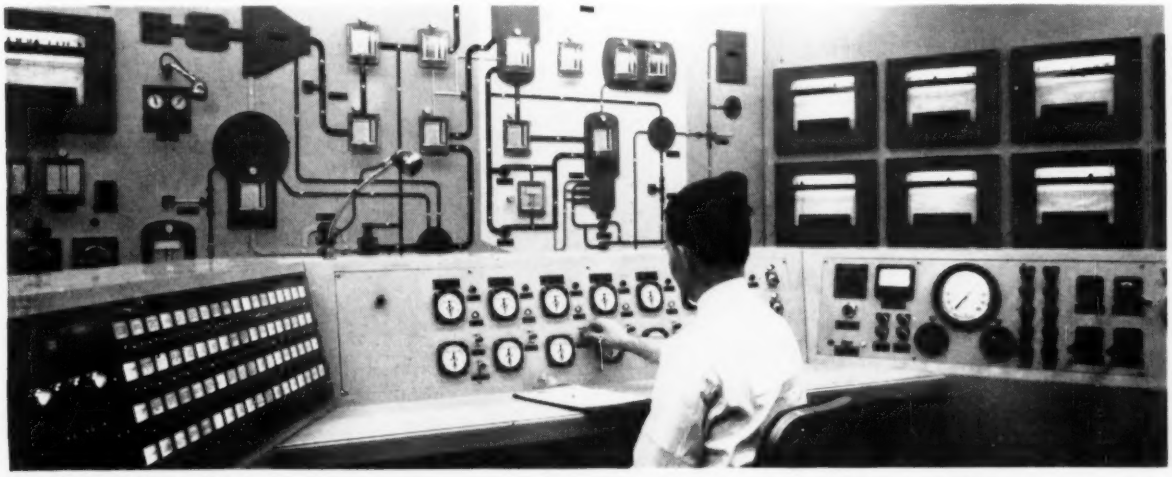
Commercial Potential—Obviously, Alco expects to sell more such plants to the Army. More important, plants of this type may be sold commercially throughout the world. There are many areas where they could beat conventional fuel costs, open new industrial possibilities in under-developed nations.

The reactor itself is of the pressurized water type, similar to that in the "Nautilus." Ordinary (demineralized) water passing through the reactor is heated and held under 1200 psi pressure. It passes to a heat exchanger where it transfers its heat to water in a secondary loop. This heat converts the secondary water to steam which is then used to drive a turbine.

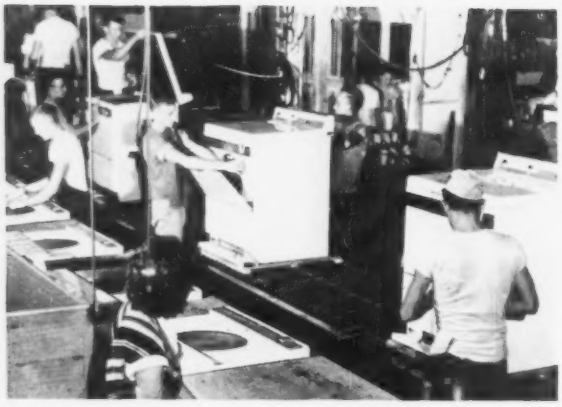
Major Equipment—Three major pieces of equipment in the primary system were provided by Alco: The reactor vessel and control rod assembly; the pressurizer; and the steam generator.

The two 4000-gpm "canned rotor" type pumps used in the primary circuit were built by Westinghouse. Primary piping is of ¾-in. wall solid stainless steel, 12¾ in. OD, provided by Tube-Turn Co.

The secondary system carrying steam to the turbine-generator set, is of carbon steel. The conventional design 2000-kw steam turbine and electrical generator was supplied by General Electric. The condenser was fabricated by Lummus Co. Instruments and panels for the control circuits are by Minneapolis-Honeywell.



INSTRUMENTATION: It's a critical factor in reactor safety and efficiency. This is the APPR control console.



Source: NEMA

Appliance Sales: Off But How Much?

	First Two Months Unit Sales		
	1956	1957	
Electric Refrigerators	624,900	604,100	Down 3.3 Pct
Electric Freezers	161,500	141,800	Down 12.2 Pct
Electric Ranges	305,000	272,200	Down 10.7 Pct
Electric Water Heaters	151,700	118,900	Down 21.6 Pct
Electric Dishwashers	72,600	73,900	Up 1.8 Pct
Electric Garbage Disposer	111,300	93,400	Down 16.1 Pct

Appliances Fight to Hold Gains

Prices, Over-Capacity Are Problems

Reports of layoffs and cutbacks are misleading. Moderate declines from record '56 don't mean disaster.

Like most industries, appliance makers are suffering from inventory aches and pains.

Long term outlook still looks good.—By G. J. McManus.

▪ How bad is the appliance business?

Reports of plant layoffs, of reduced housing starts and of lagging demand for cold rolled sheet all indicate the market for household electrical products has gone to pot.

Has it? In announcing fat gains in first quarter sales (up 11 pct) and earnings (up 16 pct), General Electric's Ralph Cordiner said shipments of consumer goods made "satisfactory" advances.

Not All Bad — Westinghouse Electric Corp. says first quarter sales of consumer products topped those in the first quarter of 1955. Moreover, Westinghouse reports a sharp pickup in consumer product sales in recent weeks. In the first 10 days of April, Westinghouse sales of these products were up 23 pct over the same period in March.

The slump in appliance sales has been exaggerated but it is not entirely a myth. Sales of most major appliances are down from 1956. Washers, vacuum cleaners, refrigerators, freezers, ranges and others are behind the 1956 pace.

Last Year Was Tops—But 1956 was a very good year for appliances. Sales of vacuum cleaners were the highest since 1947. Sales of refrigerators were the best in more than 10 years. Washers also hit a 10-year peak. Television sets had their third best year since 1947.

Sales are down from these boom levels but are still respectable.

"We had a good first quarter," says one appliance maker. "It could have been better and it should have been better but it was still a good quarter." He blames bad weather for the failure of sales to hit expected peaks. In analyzing the situation, this company says consumer earnings and savings should add up to more sales of appliances.

Inventory Policies Hurt—Tighter inventory controls all through the appliance industry have tended to magnify sales dips. "At one time," says a manufacturer, "plants would order cathode ray tubes six months in advance. Now they want delivery in 10 days or two weeks."

This thinking explains in part the recent production cutbacks and plant layoffs of the appliance industry. Plants are gearing their output to current needs and no more. They have been burned in the past when old inventory was dumped on the market and drove prices down.

Too Much Capacity? — One of the difficulties is that the appliance industry has the capacity to produce itself out of business. It can produce 10 million refrigerators a year and has a market that can't absorb more than 4 million a year. Even in a prosperous 1956, the market was overloaded and a disastrous price slashing bout ensued.

In addition to avoiding inventory buildups, appliance makers have the problem of maintaining level production in the pace of seasonal market demands. Home air conditioners are still warm weather items, although special discounts are being offered to get distributors

to order early. Production of dryers is heaviest in the winter but is tending to level off with the spread of washer-dryer combinations.

Result of this situation is that some seasonal layoffs are necessary even in prosperous times.

Changes Ahead — The whole production and distribution setup of the appliance industry is being sharpened, says one executive. He says its competitive edge was dulled by abnormal periods of shortage during the wartime and postwar periods and things are just getting back to normal.

As an example of cost-consciousness, he mentioned the design of new refrigerators. Corners are squared so that plants can go from production of stand-up to built-in models without complete tooling changes.

Prices a Problem — Loudest complaint of the industry is on low prices. Producers point out that the price of a 9 cu ft refrigerator is less today than it was in 1937. No one has found an answer to the price slashing sessions.

On the future, relatively new products are expected to sell well. Combination washer-dryers are in good shape. The trend toward kitchen living is expected to bring a further beautifying of cooking appliances, but one authority doubts that there will be any radical shift away from steel in favor of plastics.

Fast Tax Aid Denied

Office of Defense Mobilization has closed the door on three more industries for fast tax write-offs; steam boilers, mercury and oil and gas pipelines.

The ocean-going tanker goal is 99 pct completed. After one more tanker is okayed this goal also will be closed.

Five other fields, nickel, steam turbines, steel castings, mica substitutes and roll-on, roll-off ships, are being studied as a prelude to possible action.

Giant Grinder Cuts Scraping Costs

The job of scraping critical machine tool surfaces has always been a bottleneck.

This new Mattison grinder does most of the job on tough steel castings.

▪ Heavy duty grinders are opening new horizons to machine tool producers.

A giant, high-powered grinder capable of machining hardened tool steel to a flatness of less than a thousandth of an inch has been introduced by Mattison Machine Works, Rockford, Ill. Its spindle is powered by a 150 hp motor.

For fast set-up, the machine—which Mattison calls Plano 900 SS—is equipped with a magnetic chuck. Micrometer cross feeds can be set in increments of .001, .002, and .0002 in.

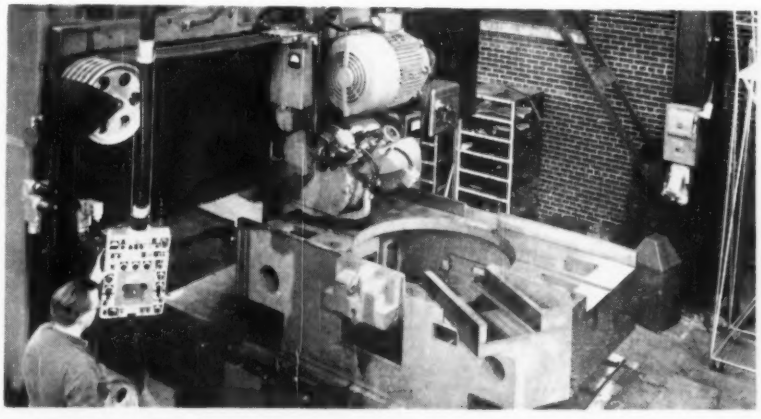
From Rough to Finish—A reverse-out button on the control pendant can take the table quickly to the out position for loading. It automatically stops the machine. The big Plano will be offered with tables 50-60 in. wide and lengths from 10 to 30 ft.

The flatness performance may well change the economics of grinding costs, particularly in machining down tough forgings and castings. The unit cut scraping time for one large machine tool part from 18 hr to two hr.

More Power Coming—"We've preached the benefits of higher horsepower, but I doubt that any of us expected we would go this far," said Alan Mattison, company president. He hinted that even bigger, more powerful grinders are on the way. A supergrinder with a 36-ft table is under discussion in the firm's design and assembly departments.

Mattison is introducing three more big grinders along with the 900 SS. One is a 184,000 lb surface grinder with a 12 ft table, a 24-in. diam vertical grinding wheel. It features automatic lubrication.

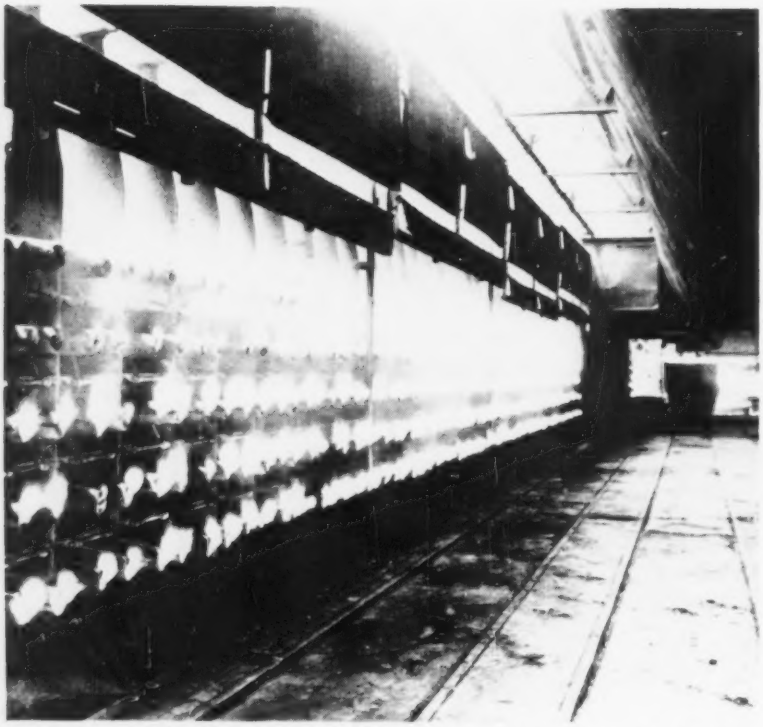
Another is a 100 hp vertical spindle surface grinder. A 50-75 hp combination way and surface grinder is also offered by Mattison.



FLATNESS ASSURED: Huge Plano surface grinder, powered with 150 hp motor, grinds ways of heavy machine tool casting to a flatness less than .001 in. Cross feeds can be set down to .0002 in.

Zinc Industry Hears a Warning

Consumers Threaten More Substitutes



MORE ZINC: Domestic producers will generate plenty of heat in 1957, as they expect to turn out one million tons for the first time. Flame is escaping from a condensor-retort where zinc ore is smelted.

In their own back yard, at the American Zinc Institute, zinc producers hear consumer complaints.

But it's not all bad news. New uses are coming and galvanized use mounts.

▪ Domestic zinc consumption is slipping. Yet U. S. producers expect to crack the million ton output barrier for the first time in 1957.

In a soul searching session, the American Zinc Institute heard consumers lay it on the line, market-by-market, on the future of zinc. It generated quite a bit of light—and occasionally mild heat.

Prices Edge Up—R. G. Thompson, of General Electric's major appliance division, warned that plated zinc castings, after grinding and buffing, are edging too high in price. Unless costs are reduced, appliance makers will seek substitutes. Appliance makers are already mulling means of getting more color into their product, he added. And it wouldn't take much to push them over the line into a substitute material.

Only automakers consume more zinc diecastings than does the appliance industry. The two consumed 75 pct of job shop zinc diecastings output in 1956. And diecasting is second only to galvanized sheet in zinc consumption.

Auto Use Drops—Joseph Gurski, Ford Motor Company, took issue with statements that the average car is using more diecastings, by weight, each year. It's been estimated that the average passenger car used 68.7 lbs of zinc diecastings in 1955, 77 lbs this year. Mr. Gurski said the lower priced, high production models are using less. Ford has only 40 lbs of castings this year, a Mercury only 42 lbs. Aluminum diecastings are a tough competitor.

In galvanized sheet, number one zinc consumer, there's little doubt that zinc use will mount in the long haul despite the present slowdown. The dozen continuous galvanized sheet lines operating in 1947 have multiplied to 34 today.

Seek New Alloy—H. R. Breslau, general manager, Southern Galvanizing Company, suggests that zinc industry seek a zinc alloy or grade that will allow heavier coatings without the brittleness usually found at the zinc-iron interface of hot-dip galvanized sheet.

Zinc men were warned that more research and increased consumer education are needed. Buyers want (1) developmental work to minimize low-temperature creep in castings; (2) higher strength castings; (3) guaranteed plating finishes; (4) color finishes for diecastings; (5) publicizing of the superior qualities of zinc for cathodic corrosion protection; (6) research into market possibilities for 99.99 pct pure zinc.

Some Promise—Some new zinc uses are promising. Zinc coated aluminum for auto radiators, permitting soldering rather than brazing, looks good to auto men. Cathodic zinc for corrosion protection has gone from 900 tons consumed in 1955 to 1800 tons in 1956.

Zinc isn't on the rocks yet. It's still healthy but with little of the zip of younger, competing materials.

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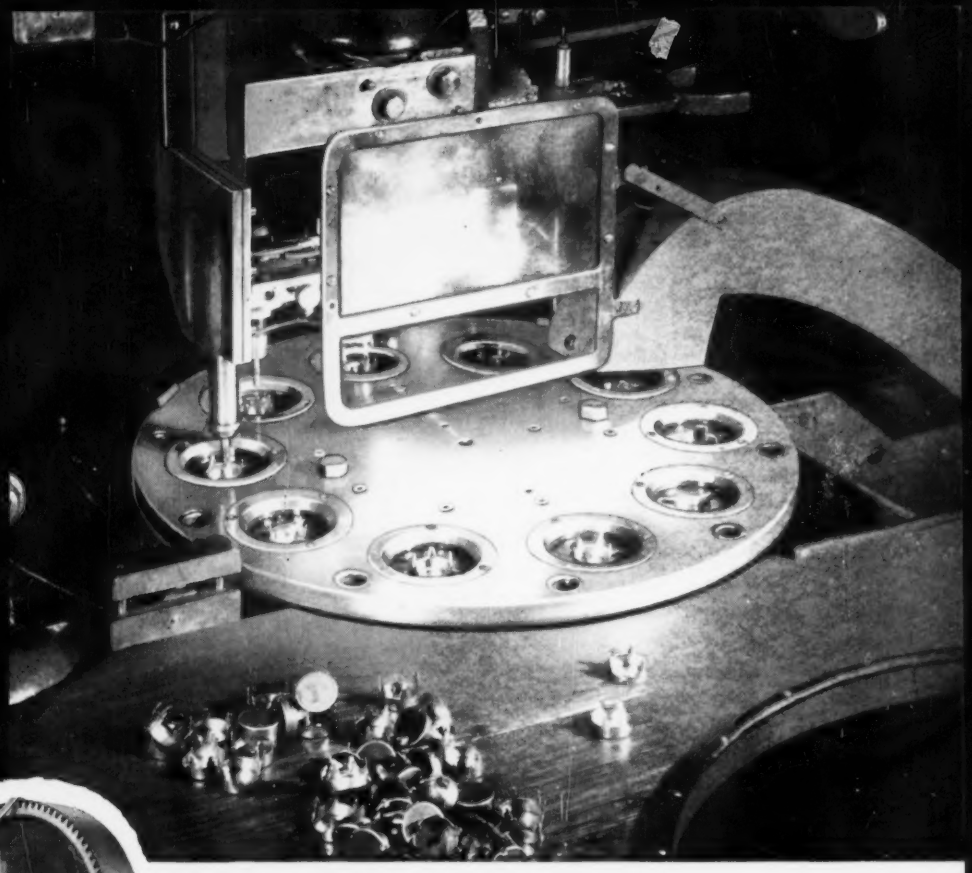

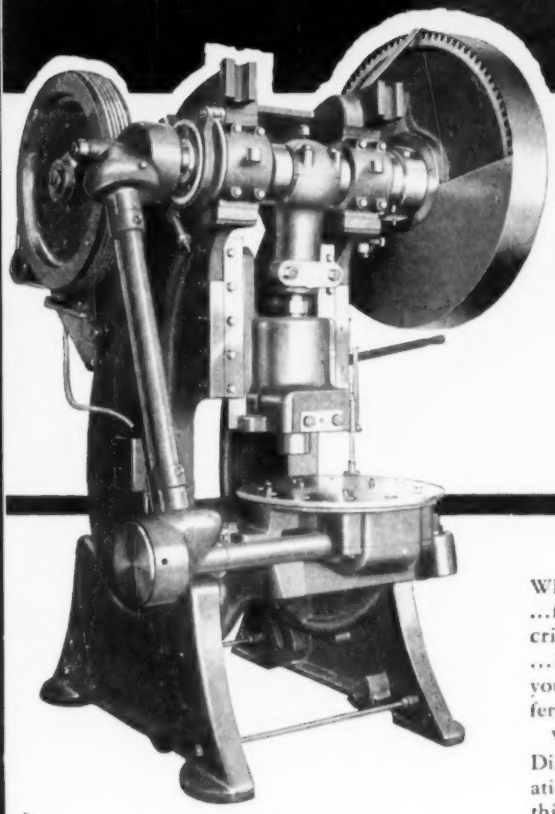

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Aluminum Food Cans Get Go-Ahead

With an order for 5.5 million cans in its pocket, Kaiser begins manufacturing two-piece cans.

Effects will be felt in tinplate market if trend develops significantly.—By K. W. Bennett.

▪ Opening with a 5.5 million can order, Kaiser Aluminum & Chemical Corp. will begin manufacture on a "demonstration" basis of two-piece aluminum food cans sometime this fall.

A four can-line plant located at Wanatah, Ind., will produce the cans for an undisclosed food processor in what is the first U. S. aluminum can line of something larger than pilot-line size.

Kaiser Aluminum process is based on deep drawing of conventional aluminum sheet, cut to disk size, to a can wall thickness of .006 in. The conventional tinplate can has a wall thickness of about .009 in. thickness, and is fabricated in three places which are joined by a double lock seam at top and bottom and application of solder or some other bonding agent along the side seam of the can.

In One Piece—The Kaiser aluminum top closure is reportedly based on a standard double lock seam at the top, with a standard sealing compound. The Kaiser Aluminum deep drawing system would conceivably produce a one-piece can of the aerosol bomb type where a top closure of some other material is to be used.

The report of this aluminum can followed hot on the heels of the announcement the week previous that Aluminium Ltd. of Canada has successfully reduced costs for an automatic aluminum can production line to cost levels of the conventional tinplate line.

A German subsidiary, Aluminiumworks Goettingen, developed the Aluminium Ltd. line, which will produce cans of 2-3 in. in diameter and 2-6 in. height. The initial Kaiser Aluminum can will be within this same size range.

Price Factors — The aluminum can is not cut to eliminate tinplate. Tinplate demand is currently strong and forecast is for a long-range climb in consumption. But can producers have been outspoken in their criticism of tinplate price increases (IRON AGE, June 21, 1956) and have made repeated efforts to increase their consumption of substitute materials. Blackplate, tinplate in coils, and now aluminum cans have been the result.

In an annual can market that is fast approaching the five billion annual output mark, 5.5 million aluminum cans are a dot-sized segment. But the American Can Co. president has already pointed out that 70 pct of American Can's output could switch to blackplate in the event of a national emergency. Blackplate, and now perhaps aluminum, can trim away some of the annual gain that would have belonged to electrolytic tinplate.

American Design Tools Going to Russia

Machine tools of American design can be shipped behind the Iron Curtain as long as they're made in a foreign country of foreign materials.

Failure of the export controls of this country and our foreign allies to match, permits shipment of some American-designed machine tools to Russia and her satellites.

Rapid Transit — Recently, two flying shears made in England under a patent license from a Connecticut firm were shipped to Austria for a new steel mill. Austria, which owes the Russians a steel mill under World War II reparations, in turn passed the shears on to the Russians.

The U. S. Export Control Act prohibits shipments of U. S. machine tools to the Russians. It permits shipments of plans, drawings, and technical data to friendly foreign countries, such as Great Britain. This act has no effect on shipments of goods made in foreign countries of foreign materials.

Not Controlled—The U. S. and 14 other allies, through voluntary agreements, control the types and numbers of machine tools and other strategic and semistrategic goods which can be shipped to the Reds. Flying shears are not controlled. Thus there is no ban on the shipment to the Russians via Austria.

Fate of BDSA Divisions Rests with Senate

Continued existence of the Business and Defense Services Administration business divisions is in the hands of the Senate. The House has already eliminated funds for these operations.

If the Upper House goes along with the Representatives it could write finis to a lot of programs.

Early End—In the Metalworking Equipment Div., the tool and die directory would never be finished. The machine tool trigger program would probably fall apart. And loss of this division would probably kill the priortiy system for machine tools for defense rated contractors, and close out the elephant tool program.

A Senate appropriations subcommittee will hold public hearings. Some officials say the House cut was made partly to needle Commerce Secretary Weeks, and partly because Congressmen don't understand BDSA.

Misapprehension—Says one official, "Many figured the agency must be a hangover from World War II, full of bureaucrats sitting around waiting for the next war."

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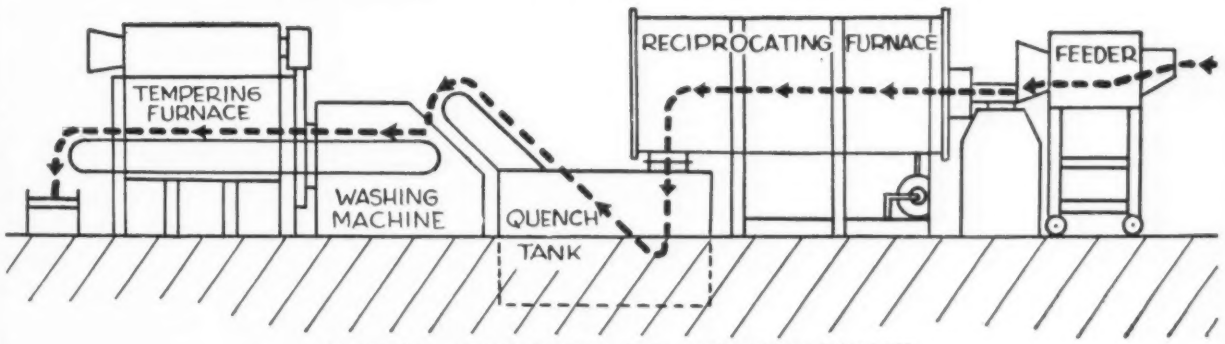

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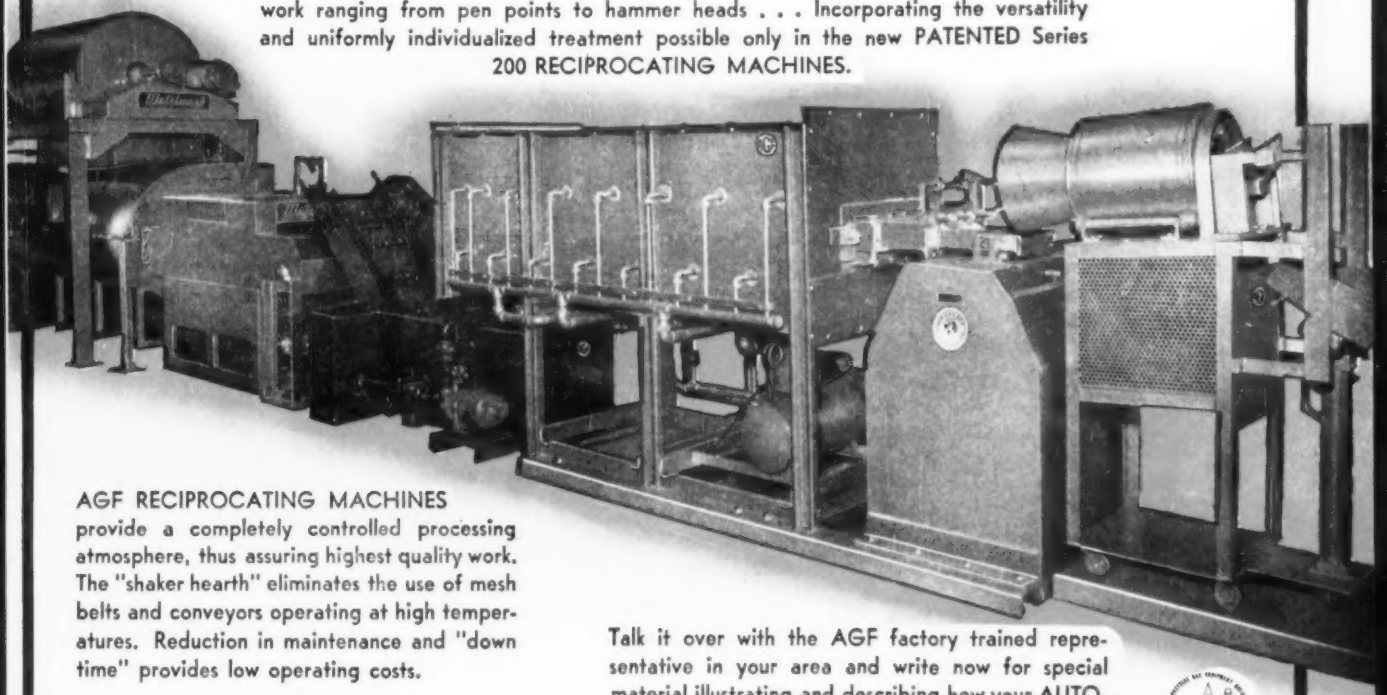

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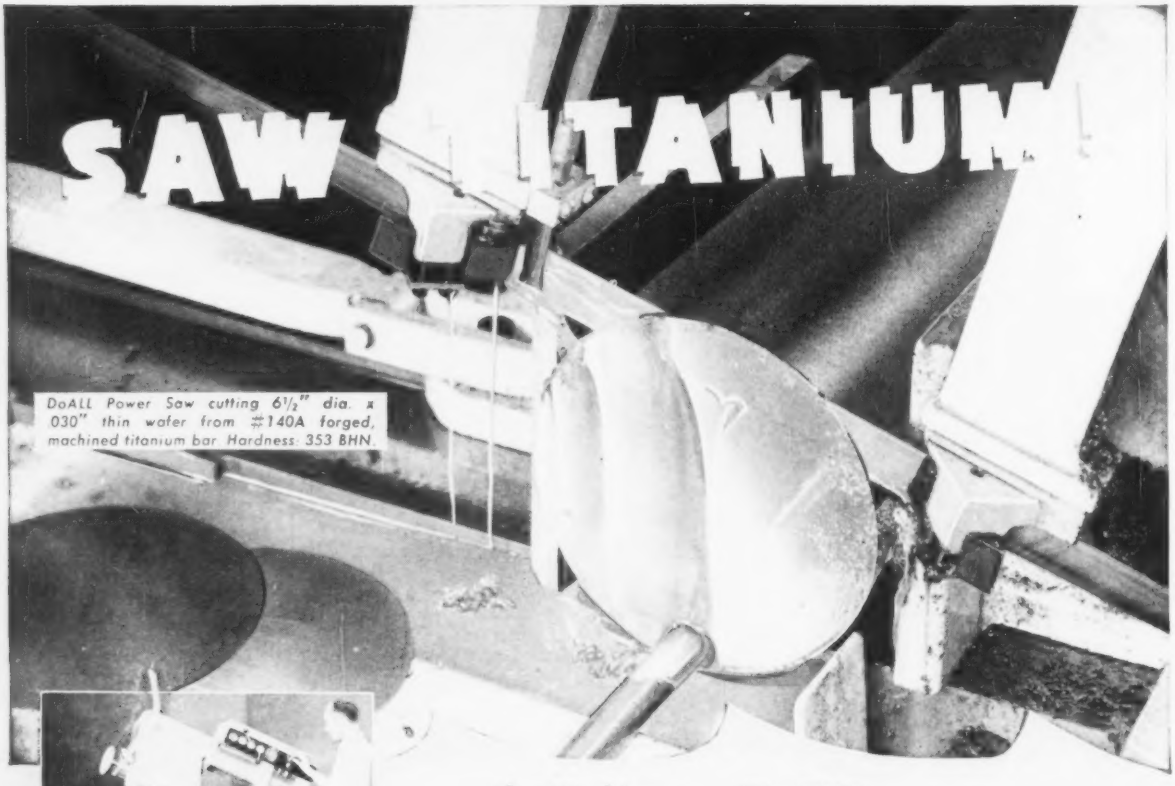
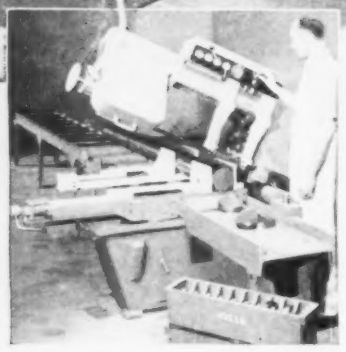


DoALL Power Saw cutting 6½" dia. x .030" thin wafer from #140A forged, machined titanium bar. Hardness: 353 BHN.



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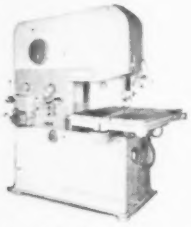
. . . and Helpful Data. Write for specific sawing data on titanium or other materials in which you are interested.



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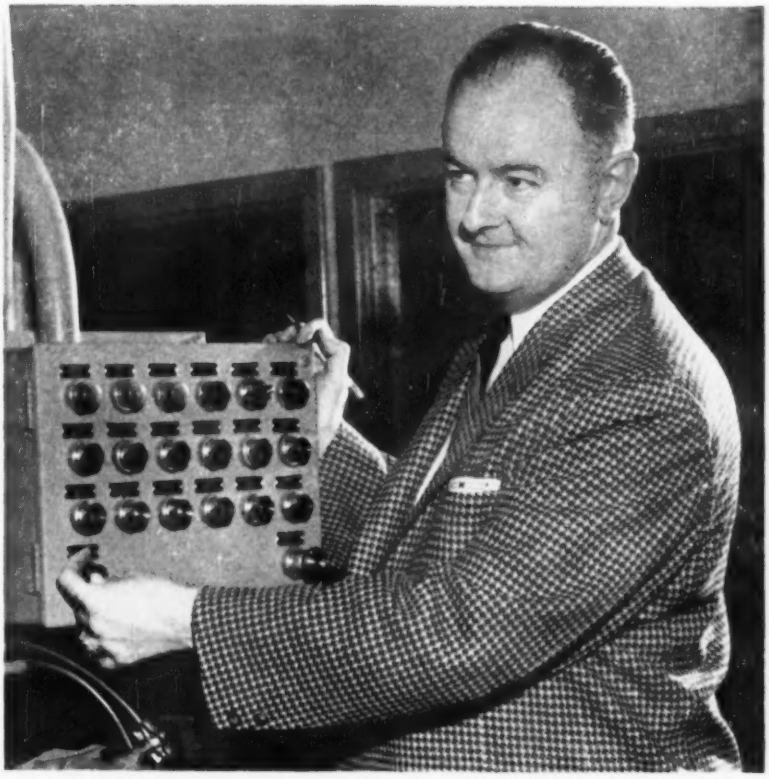
William H. Bibbens

His Tools Create Own Market

Anyone starting a business from scratch follows a road loaded with pitfalls.

This one-time apprentice spurned security of a salaried job to strike out on his own.

Result: A company that flourishes by solving production problems which have no apparent answer.



William H. Bibbens: Build a good machine and the orders will follow.

▪ Used machinery dealers do a brisk trade selling equipment to men starting a shop in cellars or garages, and then buying back equipment from the ones who fail. The difference between success and failure in a shoestring venture depends on many factors: Planning, timing, product demand, sales effort, money, to name a few.

To William H. Bibbens, president of Modern Industrial Engineering Co., Detroit, all these elements were in doubt when he set up a drawing board in his basement. He did have technical skill and faith. In 15 years he parlayed $85 into a multi-million dollar business.

Hunts Bottlenecks—Probably the most vital factor in his case was planning. He set his cap for controlling what he calls "hidden costs of manufacture." From his basement start came dozens of special machines designed to lick bottlenecks in metalworking production shops.

While the big-time machinery producers went after the obvious, Bill Bibbens concentrated on the obscure, "unimportant" operations. His high speed deburring, functional chamfering, pressure testing, and bonding machines uncovered many hidden costs for the automotive and aircraft industries.

Creates His Market—Bill Bibbens' business philosophy is defined by associates as "highly imaginative conservatism." He will take a gamble on building an entirely new type machine without even a smell of an order—if he thinks the design looks sound.

Making money from that approach takes technical experience, of course. Bill Bibbens' career began with apprentice training at Michigan Tool and Packard. Finally working up to a tool designing job with Colonial Broach, he left in 1940 to start on his own. World War II found him ready to expand.

Workers Get Shares—Once he became an employer, Bill Bibbens almost clinched his company's success with an enlightened personnel policy. His profit-sharing incentive plan is part of that policy. An abnormally low employee turnover rate stands as testimony.

Running a smooth organization to Mr. Bibbens is like operating an automatic machine. You push a button and the machine runs itself. When a problem comes up, he usually lets his hand-picked staff consider it. He merely informs and listens. "The right answer usually shows up," he says.

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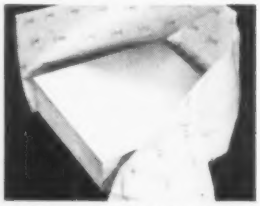
Even under adverse conditions, such as outside storing or shipping, Ferro-Pak provides complete protection. It is waterproof, strong, yet highly flexible and easy to handle. The chemical rust inhibitor is compatible with oil and stays effective for long periods even when the humidity soars.

Whether you're a shipper or a buyer of steel, it will pay you to specify Ferro-Pak wrapping wherever rust is a problem. For an interesting idea brochure on many uses for Ferro-Pak, write Cromwell Paper Company, 4803 South Whipple Street, Chicago 32, Illinois.

How to rustproof a freight car—Ferro-Pak is used to line sides of car and to interleave coils, transforming ordinary freight car into huge rustproof package.



How to rustproof black plate—On this light gauge, dry, uncoated steel, rust can start from a fingerprint. Ferro-Pak keeps black plate rust-free even when the humidity soars!

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Cost of Competition Comes High

Expansion and capital improvement programs of industry are showing up in lower profits.

While most programs are of vital necessity, executives are forced to look for new ways to raise level of corporate earnings.

■ Record sales these days are not enough. You will note more and more frequently that executives are forced to explain why net profits are down in the face of record total revenues.

The government will come in for its usual share of the blame. And so will labor, which is demanding, and getting, regular pay increases and benefits.

Capital Outlays Climb—But more and more this year executives are pointing to other costs—costs of needed expansion, required modernization, vital research—as affecting their profit margins adversely.

This is true among both finished consumers' goods and primary producers. It may be just as important for a steel company to broaden its product mix, with heavy expenditures for new equipment, as it is for an auto company to invest hundreds of millions in tooling up for its new models. And the company that lags in research is in immediate trouble.

Corporate Dilemma — There are always examples of unwise expenditures. In general, however, a large company today places its capital outlay on the basis of long term studies and firm long range plans.

But this isn't helping to placate dividend - hungry stockholders. In some companies, division heads are already complaining about tight money policies at the top.

Plans Affected—Because of the adverse effects on profits, some companies are looking closely at their plans for capital expenditures. In most cases they're going through with them as vital to the company's future.

This is one of the big reasons behind the general talk across industry for higher prices. Industry is in a new kind of squeeze—a capital expenditure squeeze. It's easier to talk about higher prices than it is to collect them. But something has to give.

Railroads Whittle at Backlogs

Applying the Brakes—Just a little of the steam is going out of the tremendous rebuilding program of the railroads.

Backlogs of both freight cars and locomotives are high and occasional surges of new orders give added impetus. Like most other branches of industry, however, a leveling off is in sight.

Deliveries of new freight cars in March totaled 9772, compared with 8184 in February. March orders were down slightly from 6065 in February to 5359. The effect was to put the backlog of cars at 107,708 April 1 compared with 111,965 on March 1 and 137,070 April 1, 1956.

Locomotive Orders Slump — There is still a lot of work to be done in the nation's shops, but unless the rate of new orders keeps up, the backlog can be cut in a hurry.

On the locomotive side of the picture, railroads had 747 new units on order April 1 compared with 859 a year previously. The roads installed 377 new units in the first quarter of this year compared with 399 in the same period of 1956.

The importance of the gas turbine-electric locomotive is gaining ground. This year there are 30 on order compared with only 15 a year ago. The remainder are diesel-electric. A year ago there were 12 electric units on order. There are none on order today.

Employment, Income at Records

Income at Record — You can't beat the combination of record employment and record income. That's why some of the extreme business worries continue to be unfounded.

Non-farm employment in March stayed at the record level of 52 million. And it yielded personal income at an annual rate of $337.5 billion, another new record.

Heavy Installments — Possibly some of the lag in new autos, appliances and other consumers goods is indicated in the heavy installment payments workers are making. In March they paid off more than $3 billion, the highest monthly rate on record, according to Dun & Bradstreet.

Employment sidelight: Department of Commerce reports that 3.7 million people, or 5.5 pct of the employment total, held more than one job in a survey period of 1956. This compares with only 1.8 million multiple job holders, 3 pct, in 1950.

Ford Develops Aluminum Frame

But It's Only for Military Vehicle

Spot-welded, unitized frame gives new vehicle light weight qualities for airborne use.

Body weighs only 124 lb, about one-third the weight of steel body prototypes.

Civilian application is a remote possibility at this point.—By T. L. Carry.

▪ Use of aluminum in automotive applications continues to grow.

But like many new developments in industry, it will get a big boost from the military, where in many cases cost is secondary to special qualities. Experience gained in this field is frequently adapted to civilian lines.

Unitized Body—A case in point is the all-aluminum unitized body for use on a new experimental military vehicle. This has been designed by Ford engineers and is being made in prototype under terms of a research and development contract with Army ordnance.

Arthur A. Parquette, executive engineer of Ford's Military Vehicles Office, says the new vehicle, a 4-wheel drive unit, is "lighter, stronger, more economical and better performing than any comparable military truck."

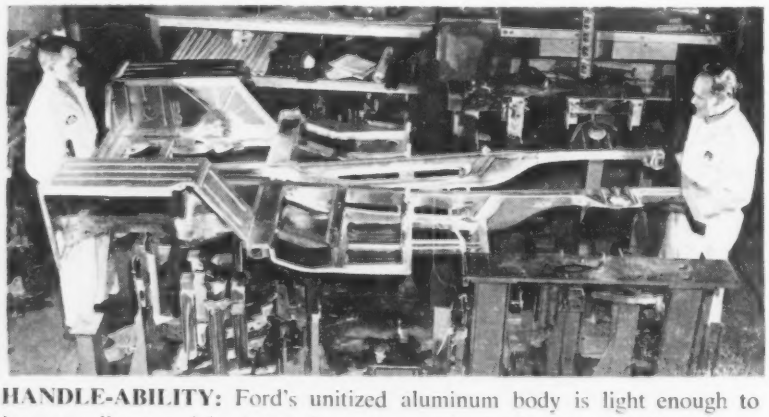
Not Yet Accepted—Ford is currently hand building both steel and aluminum prototypes of the unit for Army testing. If the vehicle is accepted, the Army will put out bids for its production.

Mr. Parquette says the light metal design was developed so the vehicle could be transported quickly and easily over long distances and parachuted to strategic defense areas.

The aluminum body, which is spot welded completely, weighs only 124 lb. The steel body weighs 336 lb.

How It Performs—The XM-151-E2, as the unit is known, has a lower center of gravity than any standard Army quarter-ton truck. It can carry four passengers and has a 30 pct larger cargo area. Wheelbase is 85 in. and overall length 132 in.

The vehicle, which is equipped with a special 4-cylinder overhead valve engine, will out accelerate any Army vehicle.



HANDLE-ABILITY: Ford's unitized aluminum body is light enough to be manually moved for inspection, at any point in the assembly line.

UP AND AWAY: Light aluminum body makes it easier for this vehicle to climb steep hills and grades.

Civilian Possibilities—Engineers don't care to speculate at this point on how feasible such an application of aluminum would be for civilian use.

The unitized body is already a reality and so is the fabrication of aluminum. But to combine the two for use on standard automobile bodies is another matter.

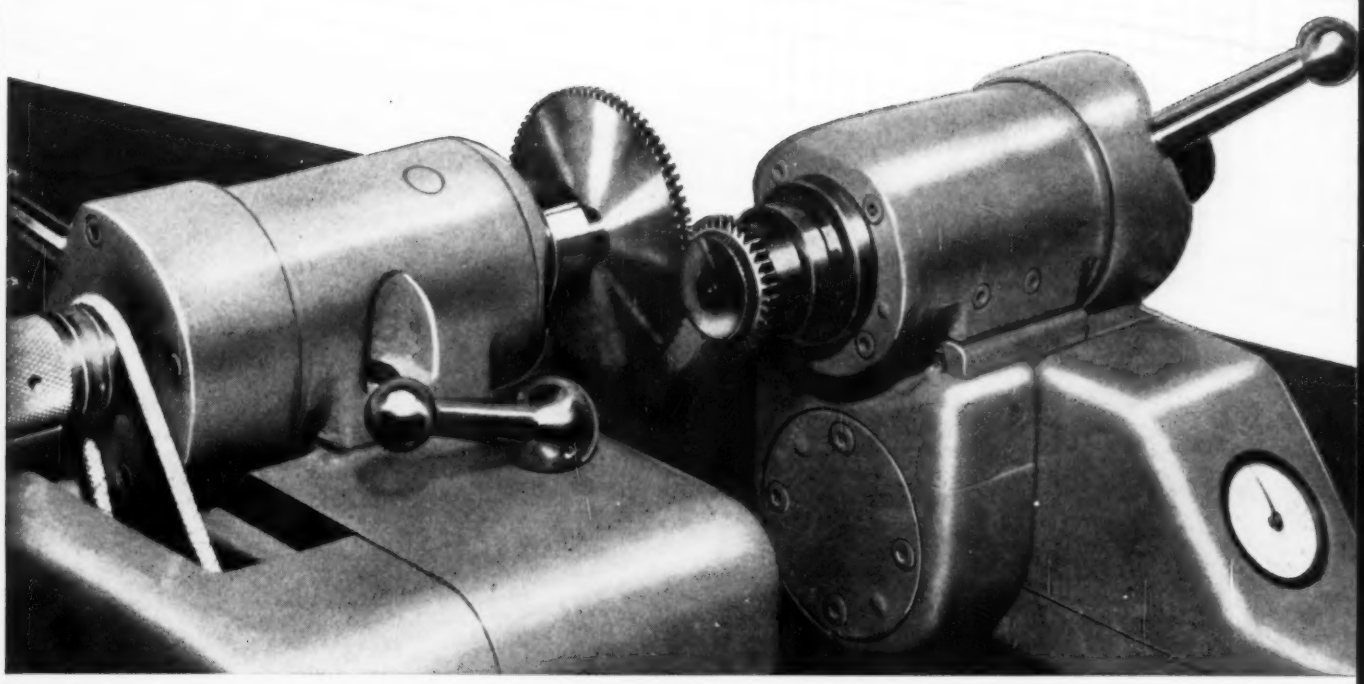
Biggest drawback, as it usually is for the start of any new product, is cost.

Thus, it is possible that once the principle has been established it may be only a matter of time before applications become broader. Such an event would make some engineers very happy because it would increase the power to weight ratio.

GM's Laminagage

General Motors Research Staff has developed a new quality control instrument for measuring the thickness of such things as paint film, electroplating or metal overlays.

The new device, called the Laminagage, can measure as little as



Make a complete test and record of your small spur and helical gears

You can be certain that your spur and helical gears will operate correctly in their final mountings if you give them a complete test *before* actual assembly.

The new Gleason No. 104 Spur Gear Tester gives you a complete check of your gears. A rolling test for composite error provides a quantitative check of tooth spacing, profile shape and runout.

In this test, the gears are slowly rotated while a calibrated spring load keeps them in metal-to-metal contact. Any error in the gears results in a horizontal movement of the drive spindle. A completely electronic pickup and recorder make a *permanent* chart of the results.

But there is still another test you can make with the No. 104 Tester—a running test, which simulates actual operating conditions, determines the smoothness of operation, noise characteristics, and tooth contact, which will actually be obtained when the gears are used.

This machine tests precision and commercial gears up to 4½″ center distance.

We will gladly furnish further information on the No. 104 Spur Gear Tester. Write for our bulletins.

The No. 104 Tester is furnished complete with an electronic pickup and recorder unit, as shown above.

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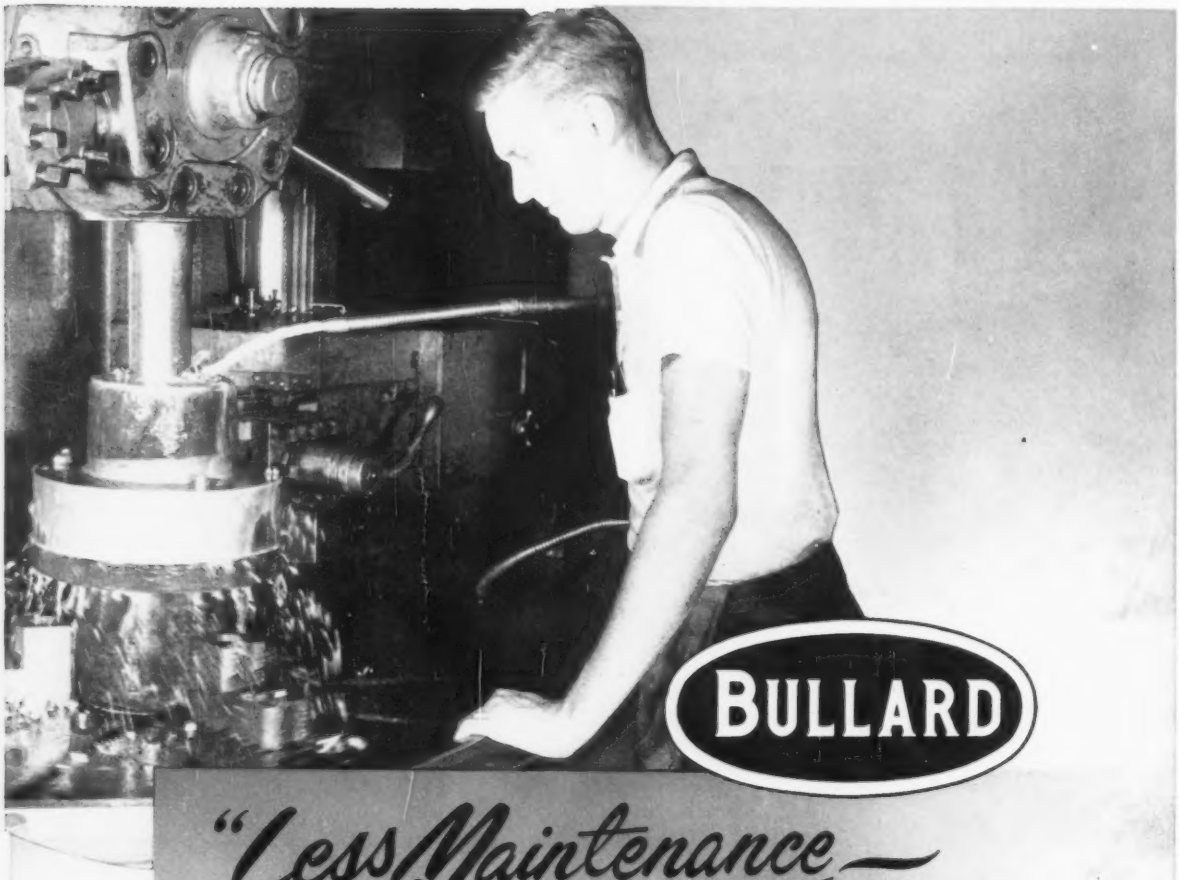


BULLARD

"Less Maintenance — Less Down Time Increased our Production"

This statement by Methods Supervisor Raymond Hoss of the Ingersoll Milling Machine Company of Rockford, Illinois summarizes one of the benefits they received from the purchase of a 36" Cut Master V.T.L., Model 75. Less operator fatigue, higher speeds, power chucking and power indexing turret are other factors which increase the overall production obtained with Bullard Cut Master, Model 75.

These same benefits can be applied to your production problems— just call your nearest Bullard Sales Engineer—he'll be glad to help—or write

THE BULLARD COMPANY
BRIDGEPORT 9, CONNECTICUT

Automotive Production

WEEK ENDING	CARS	TRUCKS
April 27, 1957	123,555	25,812
April 20, 1957	118,327	23,366
April 28, 1956	127,189	21,954
April 21, 1956	129,826	23,337
TO DATE 1957	2,290,882	373,122
TO DATE 1956	2,268,091	407,647

*Estimated. Source: *Ward's Reports*

.00001 in. It is a portable device which can be used on such items as bearings or plated surfaces where overlays or deposits must be kept within definite limits.

The instrument consists of a small metal cabinet which contains electronic equipment and a probing coil which is connected to the cabinet.

When the probing coil contacts a part under test, the thickness of the overlay on the part is registered on a dial in the instrument's cabinet.

The new unit is already in use at two GM divisions—Allison and AC Spark Plug. No special training is needed to operate it. It can be plugged into any standard electrical outlet in a plant.

What Happened To Spring Sales?

There's a subtle change emerging in the automotive sales pattern. It's underlined in the spring buying "boom" that was so fondly looked for, but which never materialized in proportions that were expected.

Some dealers and sales experts believe that it never will again. They realize that buying habits of the public are changing. The spring surge has gone by the boards and selling remains at a more constant level than in years past.

Rate Is Steady—Statistics appear to back up this theory. The daily rate of sales in January was approximately 18,800 cars. In February it rose to about 19,500 and by the end of March it had climbed to about 20,000. It's estimated that the rate has failed to climb appreciably since then.

Automakers believe that the industry has reached a plateau and sales will not go any higher. At the same time, they are not expected to go much lower until the time for new models arrives.

Some auto dealers believe that the traditional industry boom has moved from the spring of the year to the fourth quarter when new models are introduced. And they have theories to back up their statements.

Manufacturing Factors—First it is pointed out that new model production has been starting earlier just about every year. Because of improvements in manufacturing methods, changeover periods are shorter and the shift in production is accomplished much easier.

The result is that manufacturers can build up substantial new model backlogs quicker and dealers are in a better position to satisfy early demand.

There is another factor which makes it appear that the fourth quarter may be the big selling period this year. It is competition.

It's no secret here that General Motors' pride has been hurt this year. Although the corporation is still accounting for much more of the new car market than any other producer, public acceptance of its products has not been as great as it was in the past.

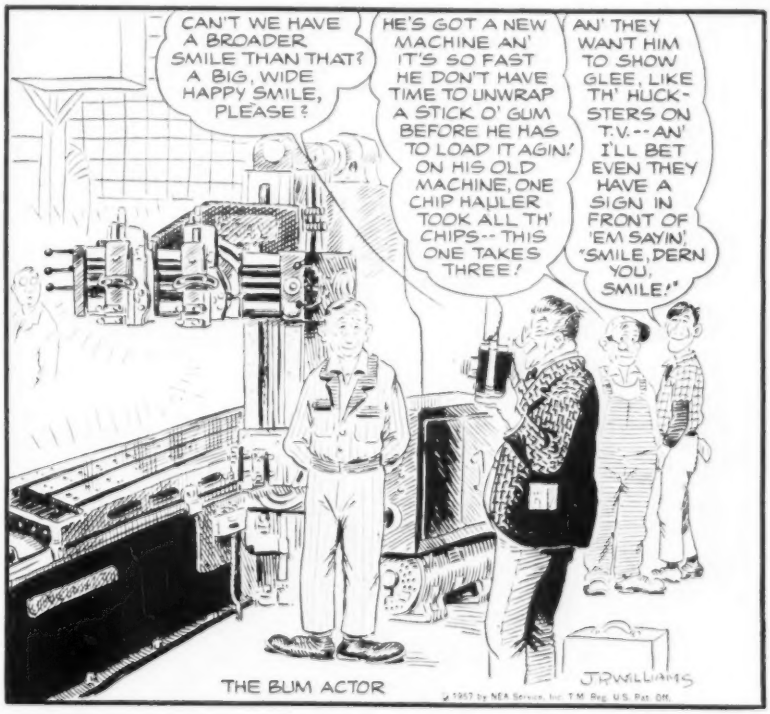
Big Changes Coming—GM plans to do something about it in 1958. Chevrolet and Pontiac will have new bodies. And it's no secret that there is going to be some major facelifting at the Buick and Oldsmobile divisions.

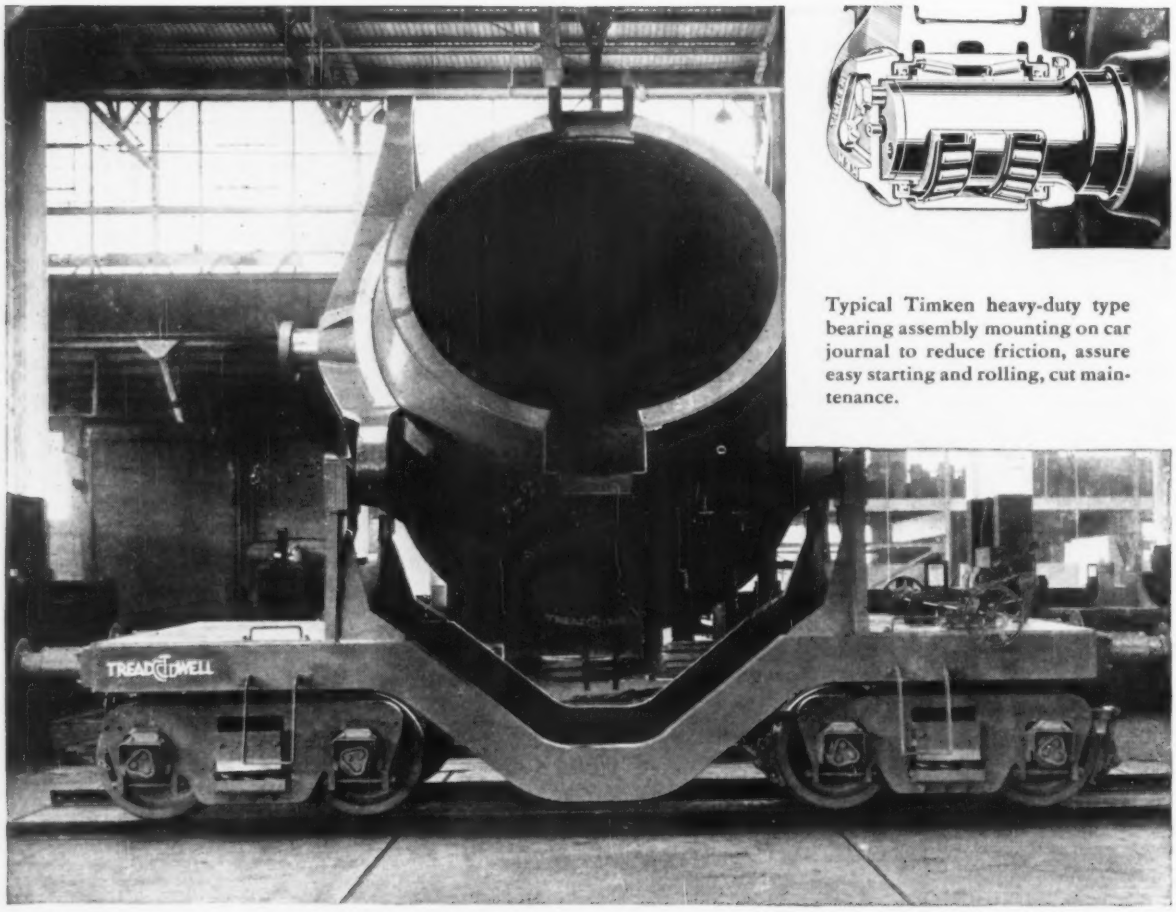
GM is aware that introduction of the Edsel is going to give it some real competition in the medium price line. It's a safe bet that the 3-piece back window on GM's B body is set for the ash can. Opinion is that such a step would be a definite improvement for both Buick and Oldsmobile. One dealer reports that the 3-piece window is one of the biggest complaints prospective customers have.

Another factor involved in GM's plans next year is its 50th anniversary. The corporation undoubtedly wants to make a big styling hit to mark the event.

Ford and Chrysler are both very much aware of what is going on. Their own plans will be governed accordingly. The result is that there will be no minor facelifting among the Big Three next year.

THE BULL OF THE WOODS — By J. R. Williams


CAN'T WE HAVE A BROADER SMILE THAN THAT? A BIG, WIDE HAPPY SMILE, PLEASE?
HE'S GOT A NEW MACHINE AN' IT'S SO FAST HE DON'T HAVE TIME TO UNWRAP A STICK O' GUM BEFORE HE HAS TO LOAD IT AGIN! ON HIS OLD MACHINE, ONE CHIP HAULER TOOK ALL TH' CHIPS -- THIS ONE TAKES THREE!
AN' THEY WANT HIM TO SHOW GLEE, LIKE TH' HUCKSTERS ON T.V. -- AN' I'LL BET EVEN THEY HAVE A SIGN IN FRONT OF 'EM SAYIN', "SMILE, DERN YOU, SMILE!"
THE BUM ACTOR
J.R.WILLIAMS
© 1957 by NEA Service, Inc. T.M. Reg. U.S. Pat. Off.



Typical Timken heavy-duty type bearing assembly mounting on car journal to reduce friction, assure easy starting and rolling, cut maintenance.

TIMKEN® bearings cut starting resistance 88% —help 75-ton ladle car roll easier, work longer

THIS 75 gross-ton-load ladle car must start, roll and keep rolling easily, and do it with safety, efficiency and minimum maintenance. Its fabricators, Treadwell Construction Company found a ready answer by mounting eight heavy-duty Timken® AP (All-Purpose) bearing assemblies on the axles.

Because they *roll* the load, Timken tapered roller bearings cut starting resistance up to 88 per cent. There's no metal-to-metal sliding friction. Loaded cars start easier and with less power loss.

Timken bearings carry the tremendous weight, take the heavy shock loads. Their rollers and races are case-carburized, with hard, wear-resistant surfaces over tough, shock-resistant cores. Full line contact between rollers and races provides extra load-carrying capacity. And because they are *tapered*, Timken bearings take *both* radial and thrust loads in any combination, without using costly extra thrust devices. They're geometrically designed and precision made to have true rolling motion, practically eliminate friction. Axle wear is eliminated. Timken bearings give long life with minimum maintenance.

And Timken bearings cut lubricant costs because they're designed with seals to keep dirt and moisture *out*, lubricant *in*.

To get all these advantages, specify Timken bearings for the machines you buy or build. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN BEARING EQUIPPED

This symbol on a product means its bearings are the best.

TIMKEN TAPERED ROLLER BEARINGS ROLL THE LOAD

Good Faith Pricing Gets Freeze

Protests Dooming Bill in Congress

Firms wanting to lower prices to meet area competition probably won't get any legislative backing this session.

Confusion over what measure would do leads to Congressional coolness.—By G. H. Baker.

▪ There's growing doubt in Congress over the merits—or lack of them—of the so-called "good faith" pricing bill.

In both the Senate and the House, a long list of members has cooled off noticeably on the bill.

Under the terms of the so-called "good faith" bills, manufacturers and producers are to be denied the right to lower their prices in selected areas in order to meet competition "in good faith."

Clouds Gather—It's beginning to look now as if this legislation won't be written into law this year. A storm of protests, from both big business and small firms, is the reason.

As a result, what's legal in industrial pricing at present will continue to be legal, and what's illegal stays illegal. Neither the Senate nor the House is convinced that the "good faith" bill now is either necessary or desirable.

Tide Turns — About the only point on which the "experts" on the bill can agree is that it is so confusing in its language as to make impossible calculating the possible consequences. As a result, congressmen are not anxious to vote for a bill about which there is so little agreement over the possible effects.

Until recently, there was widespread belief at the Capitol that the "good faith" pricing prerogative of manufacturers and producers was going to be abolished by this year's Congress. But the tide has turned. Although it is still possible that Congress will act this year to strike out the "good faith" defense in adjusting prices, the prospects have faded considerably.

Engineer Hoarding Hit

Better management can cure the ills caused by the national shortage of engineers, says Rep. Davis, D.—Ga.

He urges this management improvement in the placing of military contracts. A civilian supplier, Mr. Davis argues, should be warned that he may lose his contract if he is found "hoarding" engineers and scientists.

Subsidized Recruiting—The congressman, chairman of a House subcommittee on manpower use, criticizes the military for allowing contracts to include "excessive" sums for recruiting and paying skilled men. These allowances inspire suppliers to raid other firms and the government to get the engineers they want, he believes.

Late in 1956 the Davis subcommittee suggested to Defense Secretary Wilson some steps to prevent a waste of engineers. He was asked to: Encourage contractors to improve their use of engineers. Set up quantitative standards for cost allowances for salaries and recruiting. Renew efforts to make better use of civilian and military engineers and scientists on government payrolls.

Budget: "Fat" Is Somebody Else's Project

▪ Some new definitions, all related to government spending, are making the rounds in Washington. Here are some of them:

"Fat" or "frills" in the budget: Money for projects of interest to somebody else, not you.

"False economy": Reduction in funds for government projects affecting you, your company, or your industry.

"True economy": Reduction in funds for somebody else's projects.

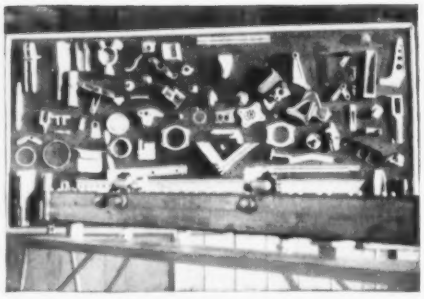
"Meat-ax" approach to a smaller budget: They're trying to take away our subsidy.

▪ Some Washington representatives who were noisily demanding a reduced federal budget early this year are now indignantly protesting the budget cuts that affect them or their clients. Congressmen, in turn, are telling them:

"You fellows are demanding reduced spending. All right, then, learn to get along with less federal help and control. Trouble is, nobody has yet figured out a way to cut spending and at the same time keep all federal programs running full blast."

◄ **Aerocycle,** a one-man helicopter now being tested by the U. S. Army, is one of the many aircraft for which Aeroaffiliates machines precision parts.

Some Examples of Aeroaffiliates' Work. All require fine tolerances and excellent finish. All were made with the help of Cities Service Chillo Cutting Oils. ►



"Fine Tolerances! Excellent Tool Life! With Cities Service Chillo Cutting Oil"

In probably no other machining operation are the tolerances so fine, the requirements so demanding as in aircraft work . . . especially when it's for the U. S. Army or Air Force.

But it is on such work that Aeroaffiliates, Inc. of Fort Worth, Texas, has become famous.

Every day, Aeroaffiliates employees must work with tolerances as fine as .0001, and their products must have an unusually good finish . . . so good that they are measured by a special gauge before the aircraft industry will accept them.

Obviously, this could play havoc with tool life . . ."but thanks to Cities Service Chillo Cutting Oils, tool life and finish are the best ever," says Aeroaffiliates. "These cutting oils are equalled only by the help we receive from the Cities Service Lubrication Engineer, a man whose knowledge and help we greatly value."

Whatever *your* type of machining operation, there's a Cities Service cutting oil tailored precisely for it . . . and a Cities Service Lubrication Engineer to help you choose it. Call him in this week. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Research Pays Off in Proportion

Better Integration Improves Results

Kaiser research chief looks to own industry to prove the value of meshing research with business.

Market potential is key guide in assigning priority ratings to various projects.

High on Kaiser agenda is work on electrical, automotive and building applications.—By R. R. Kay.

▪ "Research is simply a necessary part of doing business. Its success is directly proportional to the degree to which it is integrated into the business."

This is what R. E. Knight, vice president and director of research and development, Kaiser Aluminum & Chemical Corp., Oakland, Calif., told the National Industrial Research Conference.

More Fabricators — Mr. Knight stayed in his own backyard, aluminum production and fabrication, to illustrate his point. The number of aluminum fabricators has grown from 4500 in 1946 to 27,000 today, and the end is not in sight, says the Kaiser vice president.

The reason: extensive research to develop new joining methods, superior finishes, improved forming techniques, and a better understanding of the behavior of aluminum has been done by the major producers, and passed along to independent fabricators.

Producers Help — "Virtually every little machine shop and sheet metal shop throughout the country now has an opportunity of working with aluminum," declared the West Coast executive. And in most cases the fabricator could not have afforded to develop the knowledge by himself.

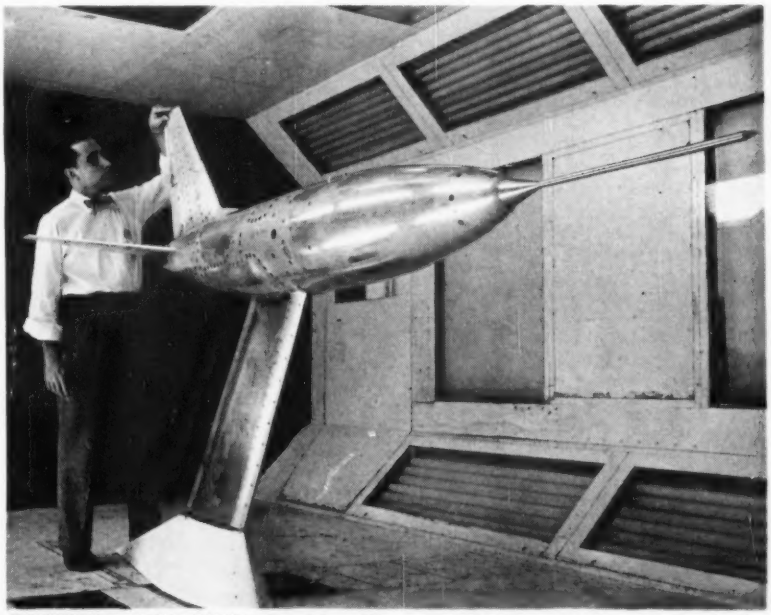
In assigning priority to research opportunities, the key factors are the special needs of each industry, and the market potential of these industries.

Looking Ahead—For Example: Although aluminum already accounts for 95 pct of new primary electrical transmission lines, and a "fair" percentage of secondary distribution systems, work in this field is high priority at Kaiser. The most looking is being done to develop better wire joining methods and improving strength-conductivity ratio, reports Mr. Knight. The reason—it is generally conceded that power generation will double every 10 years for the next several decades.

Also high on the list of full-speed-ahead projects is auto research (diecast engine block, radiator); building; and packaging and canning.

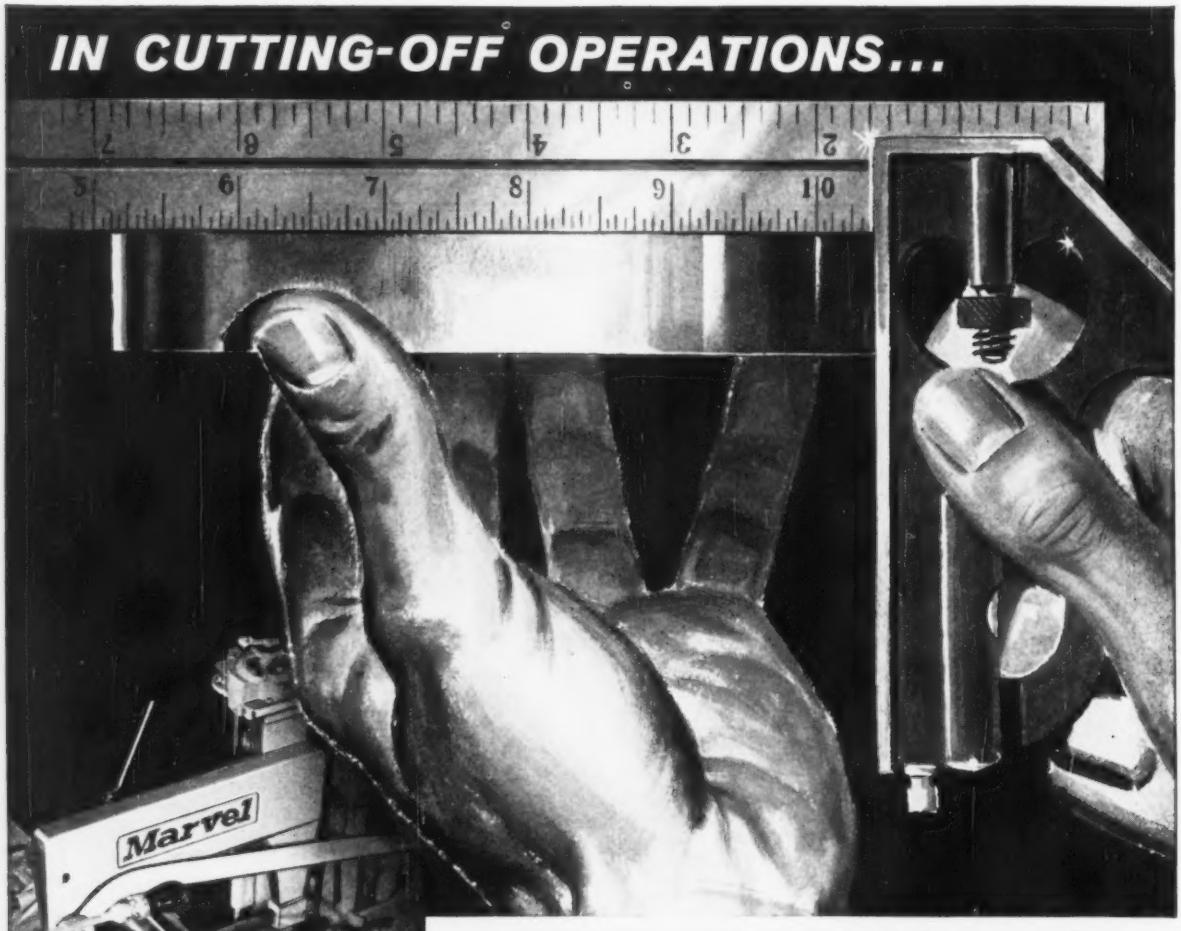
Cut Costs—One other field of research in which the Kaiser vice president claims the laurel wreath for the industry as a whole is process research — reduction of manufacturing costs and improvement of methods and finished product.

Mr. Knight points out that since 1932 price increases of other major metals are tin—353 pct, steel—361 pct, zinc—368 pct, and copper—452 pct. During the same period aluminum pig price rose only 7.3 pct.



POSSIBLE PREVIEW: Looking like an engineer's dream of a missile-shaped passenger transport yet to come, this Convair 880 wind tunnel test model is designed to permit undisturbed air flow over tail surfaces.

IN CUTTING-OFF OPERATIONS...



...SPEED WITHOUT ACCURACY IS COSTLY!

Efficient cut-off of steel blanks from bars demands a combination of speed *and accuracy*. MARVEL, and MARVEL alone, achieves this combination with machines capable of delivering feeds and speeds which fully utilize the strength and heat resistance of the modern high speed hack saw blade.

MARVEL dual power feed and crank lever method of reciprocation are two exclusive features designed to give increased speed and efficiency. This unique dual power feed employed on the Series No. 6 and No. 9 MARVEL Ball Bearing Hack Saw Machines, simultaneously controls both positive feed depth and feed pressure, automatically adjusting both pressure and depth of feed correctly in proportion to the number of teeth in contact with the work. This automatically forces the blade to cut as deeply as possible and practical on every stroke, without demanding the attention of the operator. As a result, the work is cut-off in the fewest possible number of strokes. Quick return of the saw frame on the non-cutting stroke, accomplished by the crank lever, delivers $33\frac{1}{3}\%$ more cutting strokes per minute without increasing the blade velocity on the cutting stroke.

Accuracy is assured by the construction of the machine itself. Anti-friction ball or roller bearings are used at all load carrying points. The saw frame reciprocates on fully enclosed special design ball bearings which are factory adjusted with a pre-load, assuring permanent frictionless rigidity. Saw frame, saddle, and upright are precision machined and fitted to form a rigid integral unit capable of withstanding any cutting load with no deflection or side movement.

These exclusive features found only in MARVEL Hack Saw Machines, together with the unequalled performance of the unbreakable MARVEL High-Speed-Edge Hack Saw Blade, form a team that guarantees the fastest, most accurate cutting-off.

There is a MARVEL field engineer near you capable of intelligently discussing your cut-off work. Send for catalog C-55, and the name and address of your nearest MARVEL field engineer.

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Metal Cutting MARVEL SAWS
Better Machines Better Blades

Machine Takes Cue From Tape

50-Ton Miller is Faster, More Accurate

Three firms put their heads together to come up with a new machine tool.

It's said to be the first of its type to work from punched tape.

Currently used on aircraft parts, but makers say it has wide industry potential. — By E. J. Egan, Jr.

▪ More tape controlled machine tools are appearing on the market. One of the latest is a 50-ton milling machine. Its job: To do three-dimensional production machining on aircraft and missile components.

It's said to be the first practical large profile milling machine guided by punched tape. Other machines of this type take instructions from magnetic tape.

Work of Three—The new tool resulted from a three-firm parlay. Bendix Aviation Corp., Detroit, developed the tape control system to specifications of Martin Co., Baltimore. Kearney & Trecker Corp., Milwaukee, built the milling machine. Martin will use the combination to make structural parts for Matador missiles and Seamaster jet planes.

G. T. Willey, Martin's manufacturing vice president, expects the new machine to eliminate much hand crafting of templates, jigs and patterns. With the new miller, "master model" stage of conventional production is skipped. Guided by punched tape, it goes right to work making usable parts.

Time Saver—At a recent demonstration, Dr. Albert C. Hall, general manager of Bendix Research Labs Div., spoke of the machine's time-saving potential. Formerly, he said, production of a master cam for a critical jet engine function took 5 to 10 weeks of highly skilled work. With tape-control it will take 2-to-4 days.

Preparing instructions for the new machine is relatively simple, says Dr. Hall. An engineer puts dimensions on a process sheet. These figures are then typed on a standard Flexowriter which punches them in coded form on a preliminary tape. This tape is fed to an electronic computer which produces the final punched tape for controlling machine tool movements.

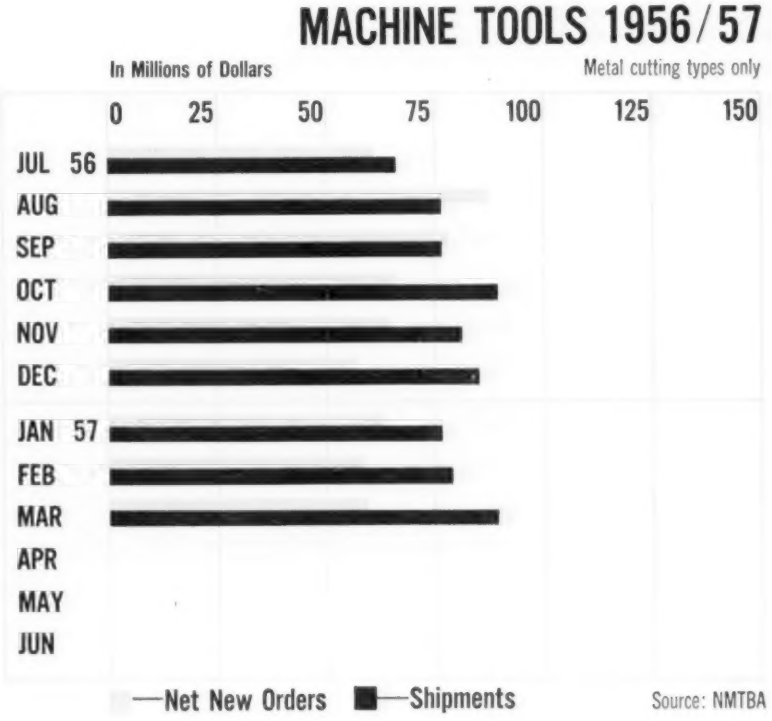
Other Potential—Bendix officials point out that their new tape system has many potential uses outside the aircraft and missile fields.

Tool Orders Rise

Net new orders for metal cutting machine tools totaled $60 million in March. This is a bit better than February's $58.2 million, but considerably less than the $89.5 million racked up in March a year ago.

March shipments of $89.9 million rose sharply from the February total of $77.7 million, and were well above the March, 1956 mark of $74.2 million.

National Machine Tool Builders' Assn., Cleveland, still expects the industry to have a good year. Net new orders for metal cutting equipment are expected to total $750-$825 million. Shipments of $850-$925 million are also predicted for the full 12-month period.



INDUSTRIAL BRIEFS

Tip Your Hat—The Derby Castings Co., Seymour, Conn., has been appointed a distributor and representative for Asarcon 773 continuous cast bronze products of the American Smelting and Refining Co., Perth Amboy plant, Barber, N. J. At this plant, a patented continuous process is turning out over 1 million lb per month of copper-base alloy rods, tubes, rectangles, and special shapes ready for machining.

Weirton Workings—The Mead-Morrison Div. of McKiernan-Terry Corp. has been awarded contracts for construction of a new coal unloading tower and rebuilding a scrap handling bridge at the Weirton Steel Co.

RAGS-TO-RICHES: A. F. Franz, president, Colorado Fuel & Iron Corp., one of 11 men who will receive 1957 Horatio Alger Awards. Award is for achieving success despite humble beginnings.

Down on the Farm—A new "All-Purpose" aluminum farm roofing and siding has been developed by Reynolds Metals Co. Jobbers and dealers need only stock one material for any job. Installations will resist winds up to 93 mph. Use of aluminum cuts maintenance costs.

Tread Lightly—Aluminum Co. of America, has placed on the market a precision-cast aluminum stair tread. Designed for use in industries, the aluminum die-cast tread utilizes a slip-proof abrasive nosing. A special aluminum alloy insures high corrosion resistance and strength, to afford long maintenance-free life.

Sterling Move—The Sterling Die Div. of Pratt & Whitney Co., W. Hartford, Conn., has completed its major expansion program, and also a move of facilities to its new plant in the Southwest Industrial Park section of Cleveland. To celebrate the occasion, an open house was held on April 30 for its clients and customers.

Try This for Size—H. K. Porter Co. has expanded production range of cold-drawn bars at its Connors Works, Birmingham. The local plant has added ten new sizes to its standard production for the steel warehouse trade in the South. Company is now manufacturing 42 different sizes of cold-drawn rounds.

Out of Mothballs—The government is considering selling its 1400 mothballed World War II Liberty Ships to foreign shippers. Proceeds would be in a fund to modernize this country's operating merchant fleet. So far, the government has collected over $150 million from the sale of reserve fleet vessels for scrap and other purposes.

Down Under — Borg-Warner Corp. has completed negotiations for the purchase of controlling interest in Coote & Jorgensen, Ltd., Australian producer of automotive parts. Borg-Warner will draw upon its American executive and technical staffs to provide management assistance, financial direction, and engineering and production personnel for the Australian company.

Tool Show Schedule—A national tool show sponsored by the American Society of Tool Engineers, will be held in Detroit every other year beginning in 1960 with the opening of Detroit's Exposition Hall in the new Civic Center. ASTE Tool Show will be held on an annual basis (after 1960) with Detroit as the location every other year.

Across the Border—H. K. Porter Co. has acquired the Federal Wire & Cable Co., Ltd., Guelph, Ont. Harold F. Nunn, vice president and general manager of the Canadian organization, will move his headquarters from Toronto to Guelph. He will continue to supervise Porter's Henry Disston Div., with plants in Toronto and Vancouver, and sales representation for several Porter divisions in the U. S.

Fast Work—A new all-metal standard building has been manufactured by Republic Steel's Truscon Div., Youngstown, O. It can be delivered "off the shelf" to the job site within two to three weeks after orders are placed. The only work required by the customer is to provide the floor or base for the building.

Easy Payment Plan—A financing program has been established for purchasers of Inland steel buildings. Plan is designed by Inland Steel Products Co. to benefit customers who wish to pay for steel buildings on installments. Financing is on a 5 year basis. Amount of credit extended is to be determined individually.

Sound Bridgework — Dr. David B. Steinman, internationally known bridge engineer, will be awarded the J. Lloyd Kimbrough Medal by the American Institute of Steel Construction. Award is in recognition of his contribution to the aesthetics in steel bridges. Since 1920, Dr. Steinman has designed over 400 bridges. Presently he is at work on the Mackinac Bridge and designing the International Suspension Bridge over the St. Lawrence Seaway.

BEHIND THE GLAMOR, WEIRZIN RUST PREVENTION

Production *and* product bonuses are all yours with Weirzin electrolytically zinc-coated steel, as many a manufacturer is finding out.

Take Farrington Manufacturing Co., Needham Heights, Mass., for instance—makers of jewel cases, display boxes and metal radio cabinets. "We make the shells for our cases and boxes out of Weirzin," a spokesman reports. "Its zinc coating prolongs the life and beauty of our Texol® covering materials because it retards rust formation which would cause surface irregularities. Interior rust stains in our delicate satin and velvet lining materials are eliminated. Furthermore, our adhesive bonds better to Weirzin than to plain steel.

"In the matter of die life, we have substantially increased our production of shells between grinds, thanks to the lubricating action of Weirzin's zinc coating."

Weirzin's zinc coating stands up under the most punishing fabrication steps, too. Won't chip, flake, peel; ends costly re-coating of steel parts after fabrication. And *chemically treated* Weirzin takes paints, enamels, lacquers and lithograph inks beautifully; holds them better than any other form of steel; eliminates underfilm corrosion. Investigate Weirzin's superior steel fabricating qualities and flawless rust prevention.

Write Weirton Steel Company, Dept. A-12, Weirton, West Virginia, for free illustrated booklet—"Weirzin."

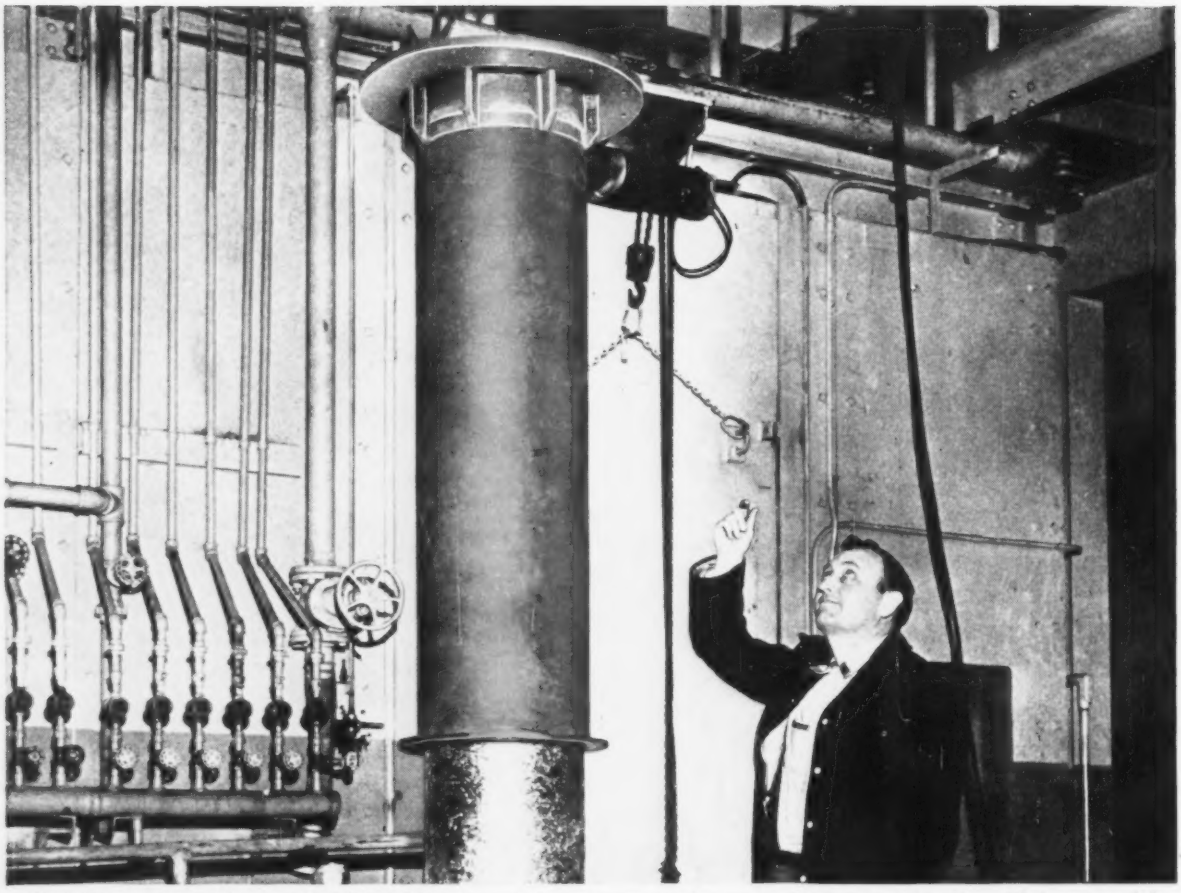
WEIRTON STEEL COMPANY

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

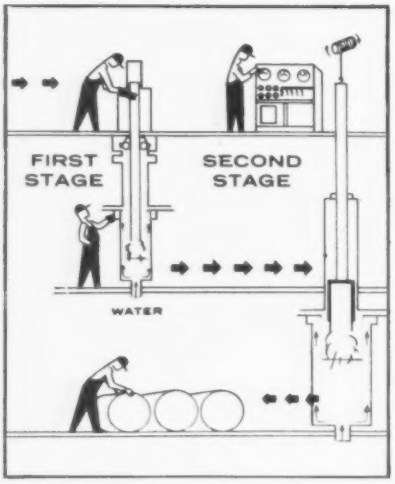
a division of

NATIONAL STEEL CORPORATION



STRIPPING titanium ingot from crucible fabricated from Anaconda large-diameter seamless copper tube. During melting, the crucible is water cooled.

How Copper helps make superior Titanium Ingots



SPONGE TITANIUM pressed into electrodes is melted in the first-stage arc furnace, forming ingots. Several such ingots are welded together and used as an electrode in the second melting. Double melting gives homogeneous, uniform ingots. A vacuum in the crucible assures low hydrogen content.

Titanium and titanium-alloy ingots that are homogeneous and have low carbon and hydrogen content are difficult to produce. Mallory-Sharon Titanium Corp. of Niles, Ohio, however, originated the double-melting process, "Method S," for production, which does the job.

A major factor in the successful production of ingots of sound structure is the use of water-cooled copper crucibles. Mallory-Sharon found that copper met the requirements for a satisfactory crucible material, particularly because of its high thermal conductivity.

Mallory-Sharon fabricates some of its crucibles more easily and quickly, using large-diameter Anaconda seamless copper tube for the body of the crucible. Various sizes are used for the crucibles—for example 20" I.D. x ½" wall thickness; and 15¼" I.D. x ⅜" wall thickness. These big Anaconda tubes are now playing a key role in producing the ever-growing tonnage of the new structural metal so vital in the production of America's jet planes.

The American Brass Company produces the widest range of seamless tubes available to industry. At one end are tubes in copper and copper alloys up to 26" I.D. At the other are the capillary tubes as small as .032" O.D. and wall thickness of .005"—for instrument control, activating lines, and other precision purposes.

Whatever your tubing problem, see your American Brass Company representative. Or write: The American Brass Company, Waterbury 20, Conn. 5764

ANACONDA®

TUBES AND SHELLS in Copper, Everdur®, Cupro Nickel, Brass
Made by The American Brass Company

T. W. Gabriel, elected vice president, commercial, Jessop Steel Co., Washington, Pa.

William L. Abramowitz, elected president, The Carlon Products Corp., Cleveland.

Ellsworth H. Sherwood, elected vice president, International Div., National Malleable and Steel Casting Co.

William E. Mullestein, elected vice president, administration, Lukens Steel Corp., Coatesville, Pa.

T. H. Gebhart, elected executive vice president, Colonial Supply Co., Pittsburgh; **J. C. Mock,** elected vice president and sales manager; **C. O. Perts,** elected vice president and chief engineer; **J. H. Ritchie,** elected vice president.

George A. Meckes, elected vice president, commercial, U. S. Steel Export Co., subsidiary of U. S. Steel Corp.

George B. Bailey, appointed manager, federal government sales, Reynolds Metals Co., Washington, D. C.

Arthur D. Ott, named traffic manager, National Malleable and Steel Castings Co.,

R. W. Wyman, named asst. product manager, rod, bar, and wire products, Kaiser Aluminum & Chemical Sales, Inc., Chicago.

Arthur W. Miller, named Nashville sales manager, The Solar Steel Corp., Cleveland.

S. J. Clokey, elected vice president, commercial, Jessop Steel Co., Washington, Pa.

Thomas W. Russell, Jr., elected vice president and **Frank B. Newbert,** named purchasing agent, American Brake Shoe Co., New York.

Roy E. Sweney, named asst. to president, Pittsburgh Steamship Div., U. S. Steel Corp.

Robert McNeal Smith, named asst. vice president, Russell, Burdsall & Ward Bolt and Nut Co., Port Chester, N. Y.

L. C. Milliken, elected president, Quarker State Metals Co., Lancaster, Pa.

Lewis R. Darlin, named central regional manager, Dexion Div., Acme Steel Co., Chicago.

Dr. Edwin Ruh, named asst. director, research, Harbison-Walker Refractories Co.

E. C. Wilson, elected vice president, Illinois Gear & Machine Co., Chicago.

Nils H. Lou, named manager, manufacturing, Parts Div., Reynolds Metals Co., Louisville, Ky.

Drummond R. Stuart, appointed general manager, Black & Decker Mfg. Co., Ltd., Brockville, Ont., subsidiary of The Black & Decker Mfg. Co., Towson, Md.

W. W. Lusk, named manager, machinery sales, The United Engineering & Foundry Co., Pittsburgh.

Arthur C. Madden, named superintendent, new seamless mill, The Youngstown Sheet and Tube Co.'s Indiana Harbor Works, E.

TAHLEN

NO-BOUNCE HAMMERS

for

FASTER WORK

and a new standard of

SAFETY!

The tubular head loaded with steel grit checks the tendency to bounce, and causes the hammer to *follow through* the stroke. This *exclusive*, patented feature of Tahlen Hammers increases speed and accuracy on any operation where a hammer is used . . . reduces operator fatigue . . . eliminates a frequent cause of *accidents* and material spoilage. The Tahlen Hammer delivers a *30% harder* blow because it controls and utilizes energy wasted in the bounce of an ordinary hammer.

SAVES MONEY, TOO! Tahlen Hammers with tenite tips outlast lead hammers 9 to 1.

® TAHLEN HAMMER CO.

4 SIZES

6 oz. to 3 lbs.

Tenite or Nylon tips

1729 First Ave. So., Seattle 4, Washington

Chicago; **Walter L. Scott, Jr.,** named assistant.

William S. Stamp, named district manager, Buffalo area, Clark Controller Co., Cleveland; **Harry Cook,** named manager, industrial sales, Cleveland office.

John F. Black, named manager, sales, Steel Mill Div., Selas Corp. of America, Dresher, Pa.

S. G. Gregory, named director, personnel services, Borg-Warner Corp., Chicago.

Gordon O. Jones, appointed credit manager, Chicago district, U. S. Steel Supply Div., U. S. Steel Corp.

E. M. Richardson, named general sales manager, Refractories Div., H. K. Porter Co., Inc.

H. J. Louth, named works manager, Crankshaft and Camshaft Div., The Ohio Crankshaft Co., Cleveland.

William A. Merriman, named manager, castings sales, Erie Forge & Steel Corp., Erie, Pa.

Russell S. Ellsworth, appointed sales manager, microline products, Ozalid Div., General Aniline & Film Corp., New York.

Charles W. Darby, named production manager, Spring Div., Crucible Steel Co. of America, Pittsburgh.

Gifford Kittredge, named manager, Commercial Div., Lamson Corp., Syracuse, N. Y.

John Cattanach, Jr., named manager, sales, tubular products and cold finished steel bars, Buffalo plant, Joseph T. Ryerson & Son, Inc.

James M. Edge, appointed asst. general superintendent, Fairfield tin mill, Tennessee Coal & Iron Div., U. S. Steel Corp., Birmingham, Ala.

Edward G. Balog, named asst. chief quality control metallurgist, management; **William C. Mayer,** named chief metallurgical engineer, development; **James W. Gray,** named asst. chief metallurgical engineer, development, Tennessee Coal & Iron Div., U. S. Steel Corp., Birmingham, Ala.

Following appointments are within the Pittsburgh district of Allis-Chalmers Industries Group. **John H. Baisley,** named manager,

61 models

A machine not put to its best use is theoretically idle. Proper machine selection is an important factor in the profitable use of a multiple spindle automatic. So extensive are the demands on this type of lathe that no single model—or number of models—can be expected to efficiently handle the wide range of work available.

To excel in any range of work a multiple spindle automatic must be specifically designed for that range. That is why CONOMATICS are provided in so many models. In no other way can the purchaser be assured of the best possible machine for his particular requirements.

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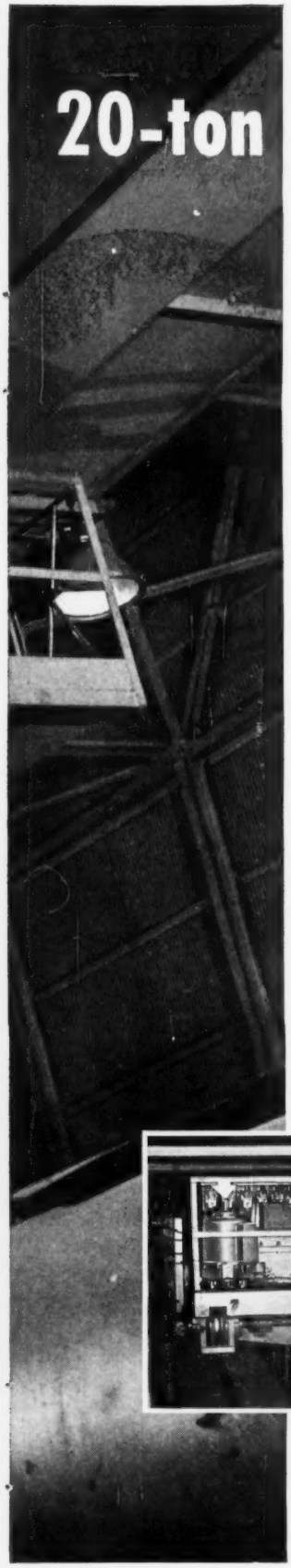
Conomatic

CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U. S. A.

Westinghouse-equipped



20-ton crane built to work 60 minutes every hour

moving skelp loads at Jones & Laughlin's modern new tube mill

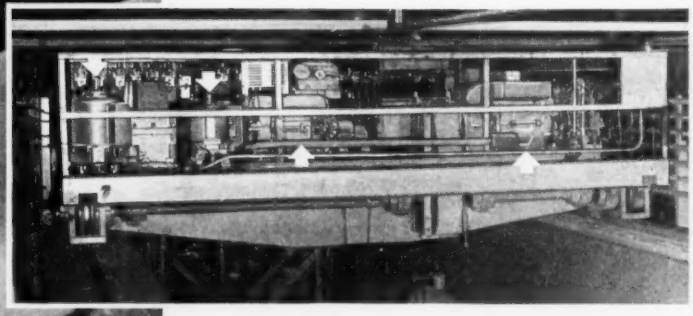
Outfitted with a C-hook, this new Movable Bridge Crane handles 9,250-pound coils of welded tube skelp, two at a time, in almost constant duty. Westinghouse silicone-insulated mill motors, fast-acting crane control and brakes are fully coordinated to give this unit the rugged stamina and positioning accuracy for continuous handling of big loads.

The low-inertia armature of the 600 Type MC mill motor assures quick response. Outstanding hoist control features an armature shunt point for light hook speed, *plus* an anti-cycling relay to prevent pumping in or out of the limit switch zone. Exclusive Westinghouse self-adjusting d-c magnetic brakes are used to assure positive braking when handling heavy loads. Westinghouse years of experience and engineering leadership have developed the industry's finest and most complete line of motors and controls for heavy-duty mill crane and hoist applications.

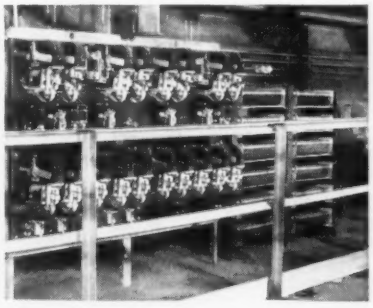
For all the facts, call your local Westinghouse sales engineer or write Westinghouse Electric Corporation, P. O. Box 868, 3 Gateway Center, Pittsburgh 30, Pennsylvania. J-22029

YOU CAN BE SURE...IF IT'S

Westinghouse



Crane is equipped with Westinghouse d-c mill motors to power bridge and trolley as well as the 20-ton main hoist and auxiliary 5-ton hook. Westinghouse SA brakes are completely self-adjusting—no adjustment or maintenance is ever necessary with wear.

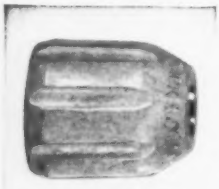


Westinghouse Type M d-c contactors and AZ relays assure millions of trouble-free make-breaks for dependable service in continuous steel mill duty. Self-cleaning, knife-edge bearings guard against dust and dirt.

now

you can get this brilliant finish directly on zinc die castings!

No electroplating--no mechanical finishing!



PART AS CAST

TREATED WITH NEW IRIDITE

NEW IRIDITE® (Cast-Zinc-Brite)

brightens zinc die castings by chemical polishing, protects against corrosion

NOW, FOR THE FIRST TIME you can get a brilliant, decorative finish directly on zinc die-cast parts . . . without mechanical finishing, without electroplating! The luster is provided by the *chemical polishing* action of new Iridite (Cast-Zinc-Brite) solution. Even surface blemishes, such as cold shuts, are brightened by this new process. No electrolysis. No special equipment. No specially trained personnel. Just a simple chemical dip for a few seconds and the job is done. And, this new Iridite has been *tested and proved* in production.

CORROSION RESISTANCE, TOO! New Iridite (Cast-Zinc-Brite) provides exceptional corrosion resistance for bright-type chromate finishes . . . also guards against blueing or darkening by eliminating zinc plate formerly required in bright chromate finishing of zinc die castings.

AS A BASE FOR ELECTROPLATING—Lower mechanical finishing costs are possible where plated finishes are *required* since the brightness provided by this new Iridite may be sufficient.

LET US SHOW YOU what Iridite (Cast-Zinc-Brite) can do for you. Send us at least a half-dozen typical zinc die-cast parts for FREE PROCESSING for your own tests and evaluation. Or, for immediate information, call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified 'phone book. *IMPORTANT: when you give us samples for test processing, please be sure to identify the alloy used.*

Iridite is approved under government specifications

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Manufacturers of Iridite Finishes for Corrosion Protection and Paint Systems on Non-Ferrous Metals; ARP Plating Chemicals

metals industry sales; **E. E. Ellis,** named manager, general industrial sales; **L. H. Walke,** named manager, utility sales.

Walther H. Feldmann, elected president, Worthington Corp., Harrison, N. J.

Charles C. Warne, Jr., appointed vice president, sales, Hubbard and Company's electrical materials and aluminum products.

James H. Gardner and **Arthur G. Walsh,** named asst. directors, Research Div., National Research Corp.

Raymond H. Jebens, named manager, customer application research, The Patterson Foundry and Machine Co., East Liverpool, O.

James D. Dickey, named general manager, jobbing warehouse operation, Pittsburgh-Des Moines Steel Co.

OBITUARIES

C. C. Morin, 73, president, Frost Steel and Wire Co., Ltd., Hamilton, Canada.

G. Donald Spackman, 61, vice president, operations, Lukens Steel Co., Coatesville, Pa.

Arthur Redmond, 56, vice president, sales, Detroit Div., Allied Products Co.

Francis R. Thompson, engineer in charge of the Electrical Engineering Dept., Mesta Machine Co., Pittsburgh, Pa.

LIMA

These three users find LIMA tops in flexibility, speed and dependability

Like hundreds of others across the nation, these three typical crane users find Limas ideal for outside materials handling. They find Limas give smooth, precise lifts, move swiftly, stay on the job year in, year out with a minimum of maintenance.

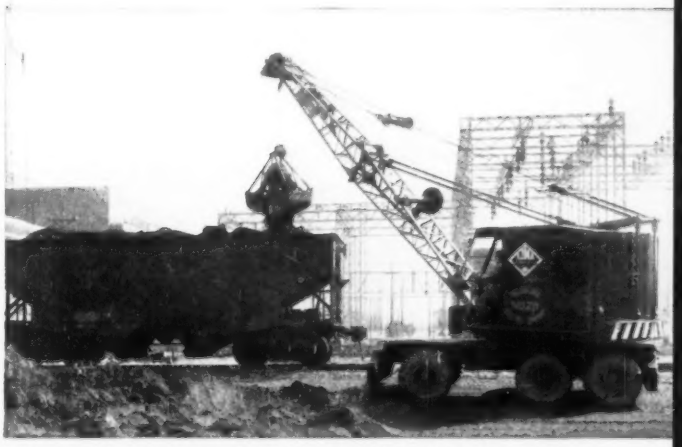
Check these Lima quality features: Moving parts flame or induction hardened for longer life; weight distributed for maximum stability; anti-friction bearings at all important bearing points; big-capacity drums and sheaves that are easy on cables; propel and swing gears and power take-off enclosed in a sealed oil bath; torque converter (optional).

Mounted on rubber for maximum mobility, Limas are available in capacities up to 50 tons and will go anywhere a truck will go at speeds up to 25 mph. If mobility is not a factor in your operation, you can get crawler-mounted Lima cranes that will handle loads up to 110 tons. And readily interchangeable front end attachments—magnet, shovel, dragline and pullshovel—give Limas the versatility to handle any of your heavy lifting and digging jobs.

Get the complete Lima story from your nearby distributor or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

Lima Type 44 Magnet Crane handling scrap in the yard of City Scrap Iron and Metal Co., Detroit. The owners say: "The purchase of this machine was based upon its outstanding capacity for long boom work with the 45-in. magnet, also upon the very economical and efficient service received from a Type 101 Lima which we bought a good many years ago . . . We consider the new Type 44 the finest machine for our type of operation that we know of."



With a quick switch from hook to clamshell on the boom, Philadelphia Electric Co.'s three Limas can handle anything from loading slag or ashes to lifting bushings from transformers during repair work. They give constant peak performance with maximum flexibility, low maintenance and high availability.

Lima Type 44 Magnet Crane, one of three Limas working for Pevin Iron & Metal Co., Detroit. Pevin says: "The metal business is based on quick handling and turnover of scrap materials. As timing is very important, we have found it most satisfactory to buy Lima machines, due to their dependability and capacity. It is our opinion, after 25 years of operation, that Lima cranes are unequaled in low maintenance and outstanding performance."

LIMA SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

BALDWIN-LIMA-HAMILTON

Construction Equipment Division—LIMA WORKS

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation • Hamilton • Loewy-Hydropress • Madsen • Pelton • Standard Steel Works

A Pamarco worker sets the mill, or male die, for final pass on a roll he is engraving with a fan pattern. The roll will be used to impart the pattern to plastics and imitation leather materials. At left, skilled engraver Claude Gallois uses a graver's tool to cut a design into female die. His work will be transferred to male die for use in engraving rolls like that shown above.

Steel Tubing With Glamour

Pittsburgh Tubes Meet Exacting Pamarco Tests

Steel tubing is glamourized at Paper Machinery & Research, Inc., with engravings so intricate they are checked on a 600-power microscope.

Cold-drawn seamless mechanical tubing from Pittsburgh Steel Company is given a beauty treatment at Pamarco's Roselle, N. J., plant to achieve patterns like those pictured here.

Pamarco and its supplier, A. B. Murray Company of Elizabeth, N. J., rely on Pittsburgh Tubes to meet exacting requirements.

Pamarco makes and engraves all kinds of industrial rolls for flexographic and gravure printing, paper converting, plastics manufacturing and textile plants.

Many manufacturers of printing presses, paper converting machinery and plastics processing equipment install Pamarco rolls as original equipment. In addition, the company re-engraves rolls, rebuilds them and provides fast engineering help on industrial roll applications.

Making micro-precision rolls for such varied uses as laminating, printing, coating, embossing, ink transferring and a multitude of other duties calls for precise engineering, rigid quality control, accurate machining and finish grinding.

In every operation, quality of the steel is basic.

From the large stocks in the A. B. Murray warehouses come Pittsburgh Steel tubes of the high, uniform quality which Pamarco must have to produce the best possible industrial rolls at economical prices.

The close relationship between Pamarco and A. B. Murray is based on not only steel but also on fast, dependable service.

The service given by A. B. Murray is backed up by the dependable tubes furnished by Pittsburgh Steel which meet these requirements, as outlined by Pamarco General Manager David Killary:

• **No inclusions or seams** are permitted since a defect can mean scrapping a cylinder during machining or engraving. Mr. Killary said:

"We've had a very favorable relationship with A. B. Murray. We've had fewer inclusions, for example. Consequently, A. B. Murray has become a prime supplier. Their service is tops."

• **Grain structure** of the steel is closely checked at Pamarco. Uniformity in grain is a must since rolls are ground and re-engraved many times through the years. Hard spots or other sub-surface defects mean the possibility of ruin to expensive engravers' tools.

Machinability is vital. Tubes that are out of balance are difficult to grind concentrically. While Pamarco dynamically balances every cylinder to insure trouble-free performance, the company says "we find Pittsburgh tubes require a minimum of balance correction."

• **Size tolerances** on tubes are another important factor. Oversized tubes require extra machining, which runs up costs. Undersize tubes may make it impossible to complete machining operations and hold to size.

If tubes are not straight, or have high or low spots, or if they belly in the middle, then it is necessary to buy tubing well oversize in order to clean up the surface to the required diameter.

Quality of the steel is demonstrated by the quality control checks made on tubes as they progress through the shop and in final inspection.

Pamarco uses a battery of high-powered optical mi-

Uniform concentricity and wall tolerances of Pittsburgh tubing pay off in machining 7¼-inch OD tube to 6.983 as it assumes proportions of printing roll.

Final check on ink transfer roll made from quality Pittsburgh seamless involves close inspection of design. Inspector at left checks overall design while partner uses gravurescope to check width and depth.

croscopes to check the engravings on steel cylinders. The depth of the engravings is checked, for example, on a 600-power gravure microscope. Concentricity and balance also come in for close examination to make sure they meet rigid standards.

Where quality of the steel is important and where good, dependable warehouse service is essential to manufacturing, the best team is the tube mills of Pittsburgh Steel and a responsible, quick-to-move warehouse.

If you have tubing problems that need good steel and good warehouse service, pick out the closest distributor to you from the list at the right and act now. Put in a telephone call and you've got real help on its way to you—fast!

Close contact between A. B. Murray salesman Jack Fischer (right) and veteran warehouse manager Frank Grippo, insures steady flow of Pittsburgh tubes to Pamarco's plant from racks at Murray's Elizabeth, N. J., warehouse.

Pittsburgh Seamless Mechanical Tubing Distributors

Baker Steel & Tube Company
Los Angeles, California
Chicago Tube & Iron Company
Chicago, Illinois
Cleveland Tool & Supply Co.
Cleveland, Ohio
Drummond McCall & Co., Limited
Montreal, Quebec, Canada
Edgcomb Steel Company
Philadelphia, Pennsylvania
Gilmore Steel & Supply Co.
San Francisco, California
Earle M. Jorgensen Co.
Perry Kilsby, Inc.
Los Angeles, California
Mapes & Sprowl Steel Co.
Union, New Jersey
Metal Goods Corporation
St. Louis, Missouri
Miller Steel Company, Inc.
Hillside, New Jersey
A. B. Murray Co., Inc.
Elizabeth, New Jersey
Ryerson, Joseph T. & Son, Inc.
Chicago, Illinois
Solar Steel Corporation
Cleveland, Ohio
Steel Sales Corporation
Chicago, Illinois
Tubular Sales
Detroit, Michigan
Ward Steel Service Company
Dayton, Ohio

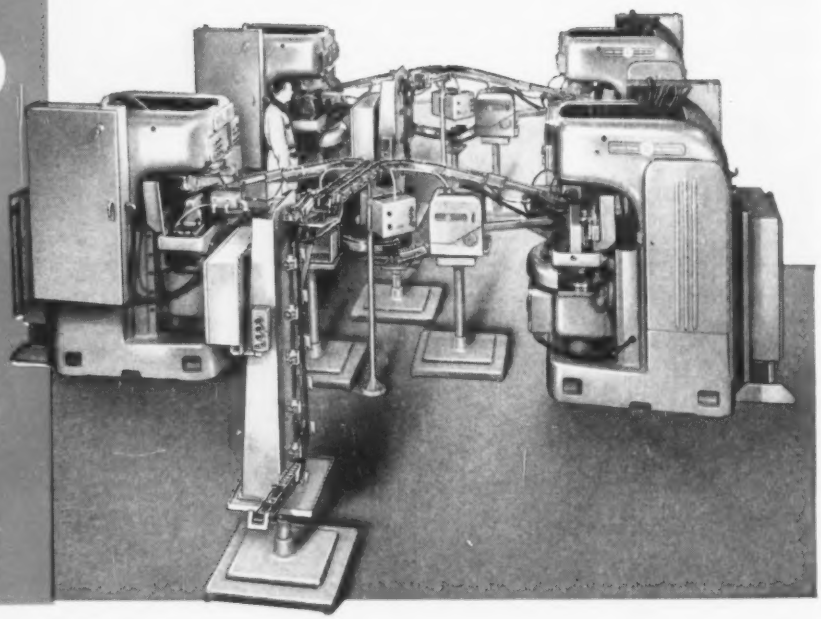
Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pennsylvania

District Sales Offices

Atlanta, Chicago, Cleveland, Columbus, Dallas, Dayton, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Tulsa, Warren, Ohio

FULLY AUTOMATED GEAR SHAVING CAN ALSO BE PERFECTLY FLEXIBLE



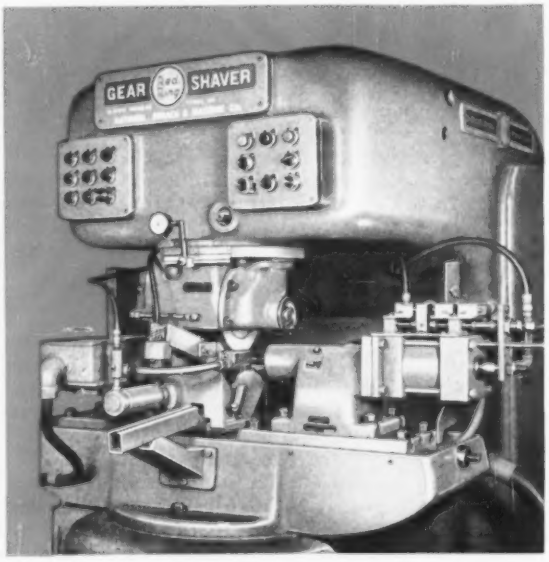
This fully automated installation shaves the split long pinion used in automatic transmissions. This pinion consists of two gear sections each of which is individually crown shaved. Output at full efficiency is 400 pinions (800 gear sections per hour).

The first pair of standard Red Ring Shaving machines processes one of the pinion sections. The second pair processes the other.

Automatic sizing gages perform a 100% check and reject any out-of-tolerance units.

Any individual shaving machine may be stopped at any time for cutter change or adjustment without interferring with the operation of the rest of the system. This is provided for by automatic switching in the feeder lines.

The flexibility of the supply and discharge lines greatly facilitate positioning the machines.



Write for further details.

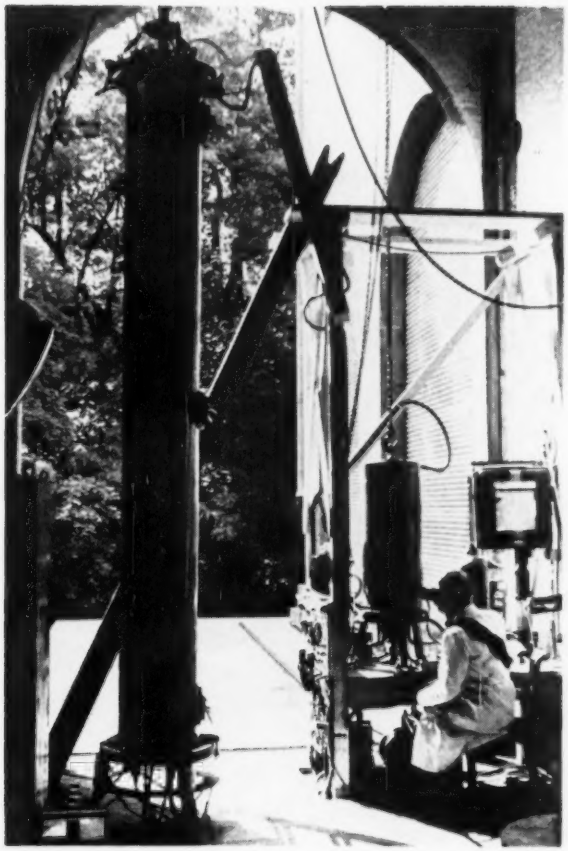
SPUR AND HELICAL GEAR SPECIALISTS
ORIGINATORS OF ROTARY SHAVING
AND ELLIPTOID TOOTH FORM

NATIONAL BROACH & MACHINE CO.

5600 ST. JEAN • DETROIT 13, MICHIGAN

7788

WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT



BIG CYLINDER: Heart of the ionitriding process is the tall cylindrical container seen at the left. This particular container was designed to nitride a cluster of long tubes in a single batch.

New Nitriding Process Uses Glow Discharge

By P. M. Unterweiser—Metallurgical Editor

Here's a new nitriding process that doesn't use a furnace or a salt pot.

Its heat is converted from electrical energy by means of glow discharge.

And it claims to be faster, providing parts with improved fatigue strength.

▪ Glow discharge nitriding is a brand new process for surface hardening. It has already been successfully applied to a variety of low-alloy steels as well as a few stainless grades.

In common with conventional nitriding, it makes use of a nascent nitrogen atmosphere. But that's where similarity ends and major differences begin.

No Furnace—Most different is the way in which the parts to be nitrided are heated. There is no conventional furnace equipment involved. Nor is an entire furnace brought up to temperature in order to heat a given number of parts.

"Ionitriding"—as it is called—makes use of an almost loss-free conversion of electrical energy into gas-ion energy and heat.

The conversion is achieved by electrical glow discharge. Each part is made to carry a cathodic electrical potential. And each part heats individually to an optimum "control" temperature for nitriding.

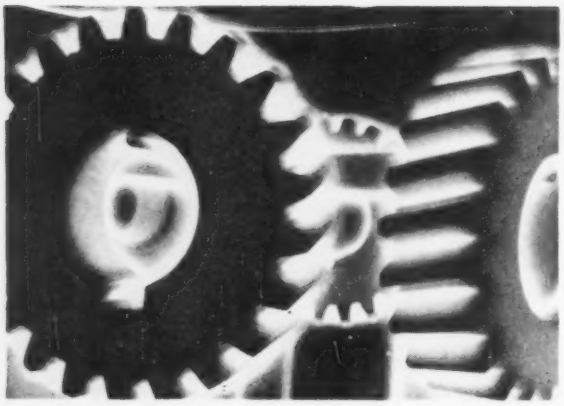
Coming Attraction — Developed by European industrialist Bernard Berghaus, the new process has already stirred wide interest in both Germany and Switzerland. Right now it is beginning to attract serious attention in the U. S.

As is the case with many new processes, the results so far achieved by ionitriding are strictly preliminary. Quite a few pertinent questions—both commercial and technical—still remain to be answered.

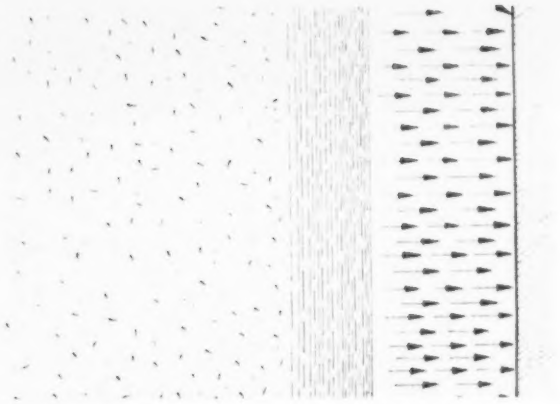
Strong Potential — But despite tentative claims, the process appears to have a strong industrial potential. Such eminent scientists as Prof. Walter Weizel (head of Bonn University's Institute of Physics) and Dr. Adolph Fry (former research director of Krupp) are now devoting their full time to its further development.

On the basis of past performance, most American metallurgists recognize Fry as a leading nitriding expert. His earlier work at Krupp was largely responsible for the development of special nitriding steels.

Government Sponsored — Additional proof of the process' merit is to be found in the fact that it is now receiving the financial sponsorship of the German - Westphalian government. Various Swiss governmental agencies have tested parts processed by ionitriding and found



GLOW DISCHARGE: Gear teeth and bearing surfaces develop a luminescent glow during nitriding. Note electrode at bearing surface, left.



BASIC PRINCIPLES: At far left is the faintly luminous gas-ion atmosphere. Moving toward the right are charged particles. These gather momentum as they approach the metal surface (far right). Considerable heat is developed. Atomic nitrogen at first penetrates, and then diffuses into, the activated metallic surface.

them superior to parts nitrided by conventional means.

How does ionitriding work? Parts to be nitrided are placed in an airtight, metal cylinder. Each part is previously placed in contact with its own individual electrode. Then the container is sealed and evacuated.

Glow Discharge—in place of the evacuated air, nitrogen and hydrogen are bled into the container. High-current energy is fed to the parts via the individual electrodes. This current both heats the parts and produces glow discharge.

Simultaneously, the gaseous atmosphere is ionized. Atomic nitrogen is accelerated towards the energized surfaces of the parts. At this point, diffusion of nitrogen into the surface begins. It continues at about the same level of activity for as long a period as is required to produce an adequate nitrided case depth.

Close Control—These, essentially, are the elements of operation. Many of the details are technically complex and defy simple explanation. Nitriding occurs at 932°F. This temperature is maintained within close limits throughout the entire cycle. (A 24½-hour cycle was used in preliminary tests.)

Temperature control is achieved by controlling electrical input. To maintain such control within close limits over long periods of time, a thermo-pile controlling device is used.

High Stability—This instrument responds to the radiation given off by the parts during glow discharge. Should the level of radiation alter—either upward or downward—the controller responds by either decreasing or increasing current input to the work. Thus a high degree of process stability is achieved.

The container in which the parts are enclosed carries an anodic potential, the work being cathode. The container never heats directly, nor does it heat appreciably. The only heat to which it is exposed stems from radiation losses given up by heated parts.

Surface Bombarded—According to Berghaus, the nitrogen atoms actually bombard the metal surfaces to which they are attracted during glow discharge. Consequently, minute particles of metal are removed from the surface of parts during initial stages of nitriding.

The total amount of metal removed by this action is insignificant. It is not large enough to affect tolerances. The tiny metal particles, in the form of a fine dust, collect on the wall of the container.

Check These — Among the advantages claimed for ionitriding are:

(1) It makes efficient use of high-current discharge for the first time.

(2) It is faster than conventional nitriding.

(3) It provides a more ductile, more fatigue-resistant nitrided case.

(4) It produces less "white nitride" than conventional techniques.

(5) It conserves power by heating the parts rather than an entire furnace.

Costs to Come—For the most part, these are tentative claims based entirely upon preliminary tests. The purely economic aspects of ionitriding have not as yet been conclusively determined. It is assumed that processing costs will not not be prohibitive.

The ultimate success of ionitrid-

ing depends primarily upon the metallurgical results it can produce. Metallurgically, some of the preliminary results obtained with aluminum - containing, nitriding (Nitralloy) steel are surprising.

Pay particular attention to the two photomicrographs shown on this page. Steel in both instances is a Nitralloy grade, properly quenched and tempered prior to processing.

Major Difference — One specimen was nitrided in a conventional double-stage cycle. Total cycle time was 25 hours, the last 19 hours of which was a diffusion cycle run at 1050°F. Still, as the photomicrograph shows, a continuous layer of "white nitride" remains near the surface.

The ionitrided specimen was processed at a considerably lower temperature (932°F). For this reason, alone, it would be logical to assume a continuous "white nitride" build-up.

Obviously, no such build-up occurred. On the contrary, the "white nitride" portion of the case is discontinuous. The distribution of nitride needles extends for a considerable depth from the surface. This distribution suggests improved diffusion.

Still Testing—Preliminary tests show that this possibly improved diffusion may apply only to results obtained with the special aluminum-containing steels. There is no appreciable difference in "white nitride" layer noted for non-aluminum - containing grades such as SAE-4130. The significance of these results has not been definitely established.

At present, there is no fatigue test data available for ionitrided specimens. Such information is now being gathered in Europe and should be made available within the next year.

Actual Parts—Pending release of such data, there remains the experience of Swiss and German sources on actual production parts. Their experience constitutes an enthusiastic endorsement. It seems to indicate that the new process is capable of producing a more wear-resistant case with improved fatigue properties.

In addition to nitriding, the new glow discharge technique has other important industrial applications.

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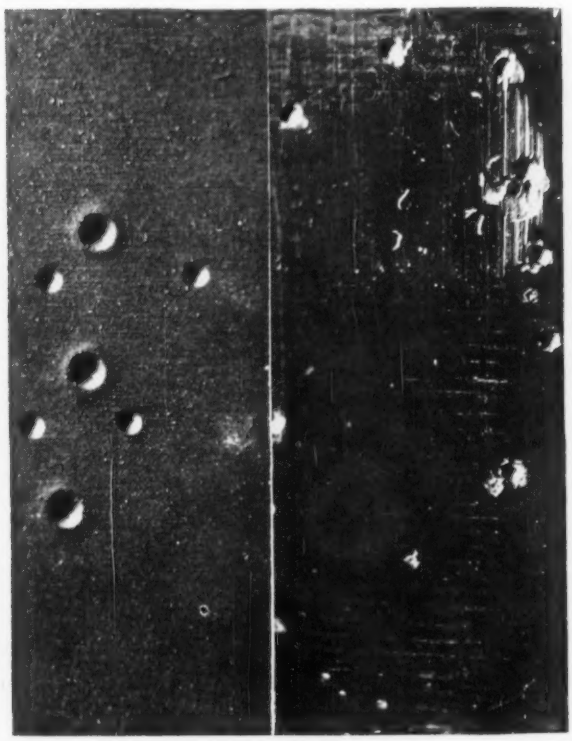
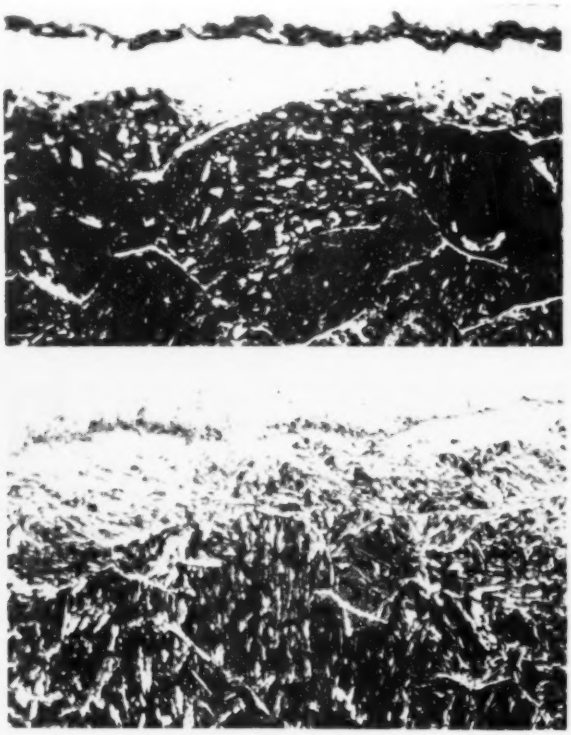
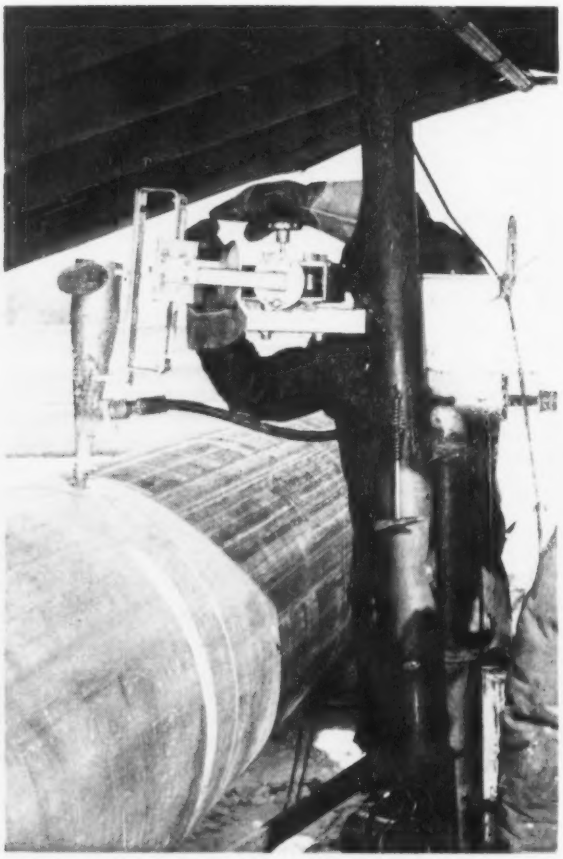


DUCTILITY: Here are impressions made by a Rockwell diamond indenter on two nitrided surfaces. Surface at left shows considerable ductility, was nitrided by glow discharge process for 24½ hours. Specimen at right was nitrided by conventional methods.



STUDY IN DIFFUSION: Conventional nitriding produced a continuous layer of "white nitride" at the surface of a Nitralloy-grade, low-alloy steel (top). Ionitriding of the same grade of steel (bottom) resulted in what appears to be better diffusion of N_2 in the case.

FIRST STEP: Specially adapted bevelling machine cuts land to accommodate sealer bead.



AUTOMATIC WELDING HEAD: Pipe sections roll automatically while head remains stationery.

Weld Pipelines Faster By Automatic Process

Pipeline builders find automatic welding adapts well to double-jointing operations. It's faster and more uniform than manual welding.

The welding head remains stationary while the pipe sections revolve automatically.

The welds show strength even when made in cold climates.

Portable equipment eases shifting of yard location.

▪ Automatic electric welding has been adapted for double-jointing pipelines to speed construction. By so doing, it cuts down manual welding by one half.

The process, which incorporates submerged arc welding, is being used by Price-Poole, pipeline constructors, in the construction of the natural gas line of Trans-Canada Lines from Alberta to Eastern Canada. In double-jointing operations on its 99-mile spread in Manitoba, the company is welding without difficulty in temperatures to —40°F.

The welds have stood up under the most vigorous tests. Routine examination for flaws includes X-ray checks.

Here's the System—The 40-ft. lengths of 34-in. diam pipe are carried to the double-jointing rack by side boom tractors. To accommodate the automatic sealer bead weld, a land is made in the pipe 3/16 in. above the factory land. A double-beveling machine, built especially for this operation, revolves around the butt ends of the pipe from a special axis.

The ends of two sections of pipe are held in perfect alignment by means of an internal hydraulic clamp. Two manual welding tacks 2½ in. long, are made while the clamp is in position. The tacks serve to hold the pipes in line until the automatic welder takes over.

FOR INSIDE WORK: This special gantry boom carries automatic welding head and operator.

X-RAY TESTS: Both outside and inside welds are X-rayed before section is carried to site.

Pipes Rotate—The pipes rest on rubber-surfaced rollers which automatically revolve when the operation is started. The automatic welding unit first applies the sealer bead, followed by a cap-out or cover bead.

All outside welding is done against a backup clamp inside the pipe to prevent burn-throughs. When the cover bead is completed the clamp is removed. The pipe now 89 ft long is rolled to the next set of turning rolls.

The inside or back-up bead requires a gantry boom which rides inside the pipe. The boom carries the automatic welding head with the operator lying on a fixed platform.

After the internal weld has been completed, the 80-ft section is X-rayed and trucked to the site.

Although semi-automatic electric welding has been used during recent years, the automatic submerged arc welder has provided the basis for completely automatic operation. Both the external and internal welding heads (adapted Lincolnweld ML-2s) remain stationary during the welding process.

An entire weld takes seven minutes to complete. It would take you more than an hour to do the job with manual welding.

Equipment Portable—The Price-Poole automatic welding operation and the double-jointing yard are unusually portable. The power supply, including three 600-amp SAE Lincoln motor generator sets and a 75-kw Caterpillar generator, are housed in a mobile trailer.

The Cross-Curran double-jointing rack can be taken down in short order and loaded on a low-boy. The low-boy and trailer are then towed to the next location.

The company first set up its double-jointing yard at Crandall, Manitoba and recently moved it to Oak River. Elapsed time for the moving job was eight hours.

Development of the automatic welding process for the double-jointing operations was done by Barney Elliott and Don Barchus, of H. C. Price Construction of Bartlesville, Okla. Elliott is superintendent of the double-jointing operations for the Trans-Canada project. Barchus, formerly with Lincoln Electric, teamed with Elliott to work out the new process.

Elliott and Barchus either developed their own equipment or adapted standard equipment to their special requirements.

Dress Your Grinding Wheels While They Work

Up to now, one irksome factor has limited peak production in form grinding operations.

The culprit: time-out for wheel dressing at frequent intervals.

At last there seems to be a simple but quite effective solution to the problem.

▪ Firms doing production form or thread grinding stand to gain many benefits from a new process called Perpetual Form Control (PFC). It eliminates time-out for wheel dressing during the grinding cycle. It does this by continually maintaining a perfect form in either vitrified or resinoid bonded wheels, using a wheel dresser that lasts for months, even years.

The potential benefits from this technique are manifold. For example, every minute of wheel-dressing time that can be saved means an equivalent gain in actual grinding time. Supplement this with the time saved by an automatic loading and unloading device, and any grinder is literally forced to work at peak efficiency.

Forget About Inspection — Another obvious benefit stems from the basic concept of perpetual form control. All other conditions being favorable, a perfectly dressed form wheel must grind each workpiece to required dimensions. Thus, with on-size grinds assured at all times, there is no need for elaborate and costly quality control setups.

The perpetual form control technique and equipment was five years in the making. It was developed jointly by Jones & Lamson Co., Springfield, Vt., and Koebel Diamond Tool Co., Detroit. Official announcement of the process has been withheld until now, although a leading automobile firm has used it in production for more than a year.

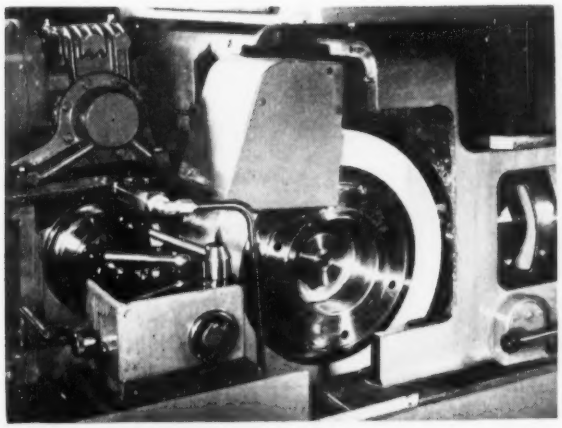
This high-volume application called for grinding multiple, straight-sided grooves in splined transmission shafts of hardened steel. A leading German automotive producer has also ordered PFC grinding equipment to do a similar job.

PRODUCTION JOB: Multiple CDP form cutter (top) maintains true form on the wheels that grind the four grooves in this hardened shaft.

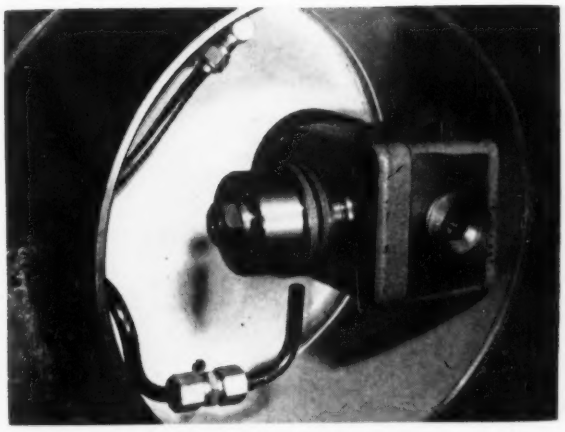
Two Key Parts — Theoretically, the PFC process is relatively simple. It uses just two key elements: (1) a formed wheel-dressing tool or cutter, and (2) the necessary grinding machine attachment to keep the cutter in proper contact with the revolving grinding wheel. Contact can be continuous or intermittent.

The formed cutters used in the new process are the cemented diamond particle type (CDP) produced by the Koebel Co. Basically they are disks of powdered metal compacted to precise dimensions of diameter, face width and form contour. Tiny diamond particles (literally diamond powder) are cemented into the powder metal matrix at those rim areas where wheel-dressing contact is to be made.

Repeat Performance — All of these diamond particles share the wheel-dressing load. This is in



ALWAYS READY: CDP cutters on this form grinder are mounted on a horizontal feed cylinder behind the grinding wheel spindle.

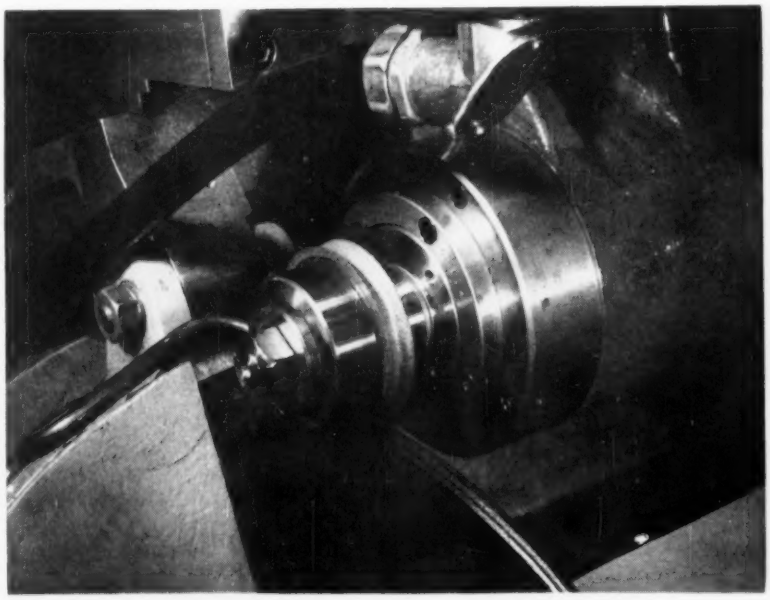


SIMPLE ASSEMBLY: To maintain form on a single grooving wheel, spaced diamond particle segments are mounted inside the cutter-feed unit.

marked contrast to form-dressing tools that use a single diamond. Such tools often vary widely in performance because of inherent structural differences in the diamonds themselves.

With CDP cutters however, reproducible results are easy to achieve. Although individual diamond fragments may behave differently, they average out to produce uniform dressing action, either for one cutter or any number of duplicates. This is ideal for automatic dressing since it removes any need for operator judgment or manual adjustments.

But regardless of how efficient a CDP cutter may be, it cannot dress a form into a grinding wheel until it makes contact with the abrasive grain. To do this, special equipment must be added to the grinding machine itself.



FOR WORM GRINDING: Small CDP cutter rotates, also feeds downward to continually dress the form on the edge of the grinding wheel.

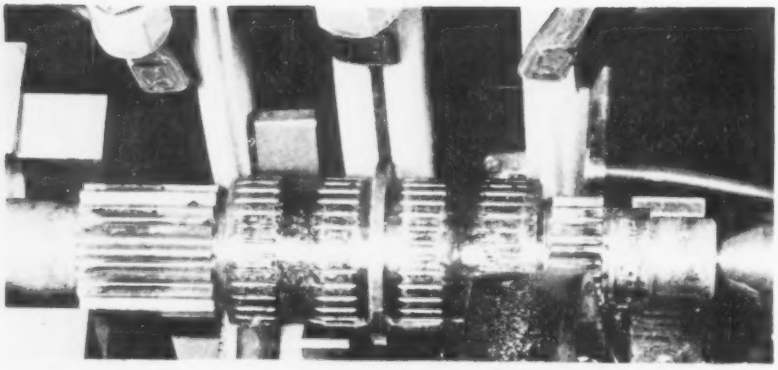
Two Units Designed—Jones & Lamson has designed two such units for mounting CDP cutters. One type is already available as optional equipment on the company's form grinders. The other design is a prototype attachment for J & L thread grinders. Presumably, other grinder manufacturers will eventually be able to use modified versions of these devices on their own machines.

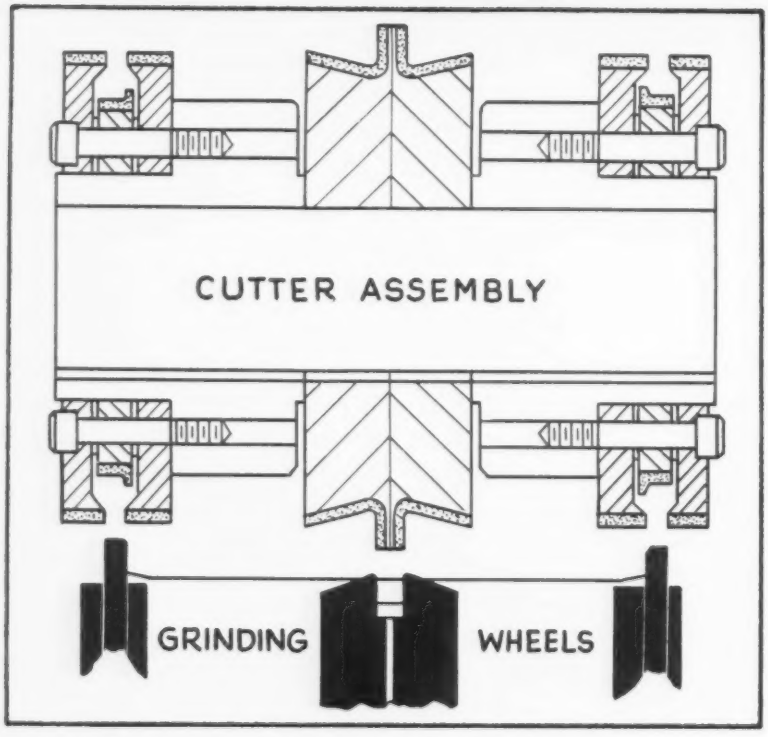
Both types of these cutter-feeding devices have built-in motor drives to revolve the formed cutter at a predetermined wheel-dressing speed.

Each design also incorporates a differential feed arrangement. This automatically advances the grinding wheel to compensate for wheel wear. It also advances the CDP cutter the exact amount required to maintain correct wheel form and work size at all times.

Coolant Plays Part—An ample supply of coolant is also essential to the PFC process. It improves the efficiency with which the diamond particles in the formed cutter actually cut the abrasive grain. By minimizing abrading action between the edges of the diamond fragments and the wheel surface, the fluid prolongs cutter life.

However, coolant flow must be closely controlled, both as to direction and force. Shaped nozzles and a pressure of about 25 psi drive the liquid into the point of wheel-cutter contact. The high-pressure stream carries off debris in the





OVERSEAS PROJECT: Multiple form cutters (hidden from view in photo) keep wheels correctly dressed for this critical grinding job in a German auto plant. Sketch shows how individual CDP disk segments are combined and mounted in Perpetual Form Control process.

form of abrasive grit and bonding material, and blasts open a free-cutting wheel surface.

Engineers from both the Koebel and Jones & Lamson firms have observed the PFC process through countless hours of shop tests. They've also watched it carefully in full production use on automobile parts. In so doing, they've noted several other benefits of interest to potential users.

Cutters Don't Wear—One of the most important is the apparent lack of wear on CDP form cutters through thousands of wheel dressing cycles. For example, the dimensions of one brand new cutter were carefully checked before it was put into service.

This tool was then used to maintain a precise form on 15 grinding wheels, one after another, as they wore down with use. It took eight hours of grinding to wear each wheel from its original 20-in. diam to a final diam of 16 in.; it ran a total of 120 hours.

At the end of this time another careful check of cutter dimensions showed negligible wear. The CDP tool was still capable of maintaining correct form on an indeterminate number of additional wheels.

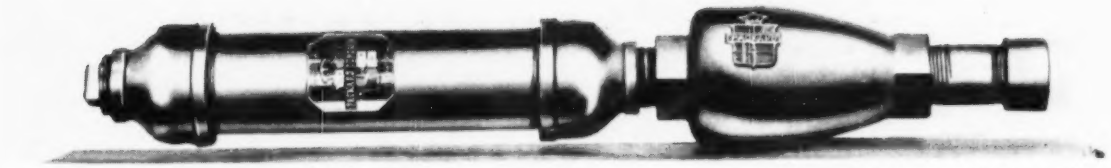
Good Finish, Too—Still another user benefit is the surface finish obtained when grinding wheel form is maintained by the PFC process. At least a 30 microinch finish is assured on the diameter of any groove. And the finish produced on the straight sides of grooves averages about 2 microinches, due to what is virtually a honing action as the grinding wheel penetrates the work.

Experience with the process also proves conclusively that the CDP cutters do not have to be "babied" in any way. In fact, they can be used to produce a proper grinding form from the solid, flat face of a new abrasive wheel. There is no need to buy expensive formed or semi-formed wheels from the manufacturer.

It follows logically that CDP cutters can also be used to remove form contours from grinding wheels whenever a new form is required. In one such demonstration, a form 3/8 in. deep and 2 in. wide was removed from a wheel in less than five minutes.

Expect More Progress — Both Koebel and Jones & Lamson officials point out that the PFC process, despite some production successes, is still in the development stage. Cautiously, they say it should not be considered as a form-grinding "cure-all," and that each application must be carefully engineered.

Still, a considerable degree of standardization in CDP cutter forms can be expected in time to come. This will permit complex formed cutters to be built up from standard segments to an even greater degree than is now possible. As a result, the PFC process will be much better suited to short-run form and thread grinding.



Conditions Water: Alnico magnets in this water conditioner have eliminated the problem of scale formation.

Condition Water To Cut Phosphating Costs

There is no excuse for chipping scale from phosphating tanks when there's a simple device to treat water before it enters your plant.

It's plain economy to consider this proven method of eliminating scale.

▪ When expensive overtime is spent manually chiseling scale from a tank and heating coils, it is time to consider methods for improvement. Especially so when the coils can never be completely cleaned by chipping.

A review of the operating practice and costs at American Coolair Corporation revealed that a big part of the maintenance dollar was being spent in connection with the upkeep and operation of the 900 gal phosphoric acid tank. This manufacturer of industrial, commercial and domestic fans depends on the phosphating process to insure proper finishing.

Fan blades, shutters, orifice panels, and supports must hold their paint finish under a barrage of adverse conditions.

Rough Job—At the end of the work week the spent solution would be transferred to the rinse tank. Even with two men working on Saturday manually chiseling scale, the stainless steel coils weren't completely clean.

Furthermore, in spite of taking precautions to keep the lid on during the night, it would take four hours of heating daily to bring the bath up to temperature. The night watchman would have to turn up the gas heater at 4:00 AM so that operations could start on time.

Management had heard a lot about the "gadget" type, non-chemical water conditioner. They decided, with a money back guarantee, to give it a try.

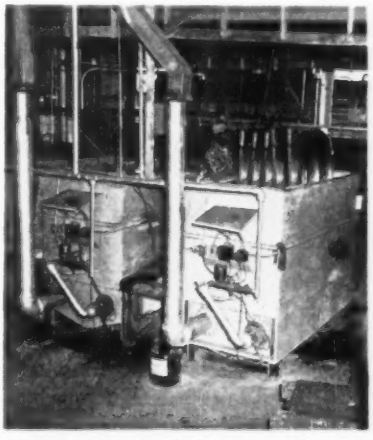
Following the manufacturer's recommendation, the firm installed a 2-in., 52-gpm Packard Water Conditioner vertically at the point where the city water line entered the plant.

Scale Washes Away—From the day of installation to the present a chisel has not touched the tank walls or heating tubes. The existing scale became soft and washed away. The weekly clean-outs have become simple hosing operations. Time for heating each morning was reduced by a full hour.

Very soon other pleasing results began to show up. Heating bills became appreciably reduced. Auxiliary equipment such as valves and controls connected with the system required less maintenance attention.

In principle, the Packard Water Conditioner passes the water through a mechanical force field created by Alnico permanent magnets. In theory, the molecules of scale-forming substances receive a superficial tension due to electrical bombardment. This tension prevents the scale formation of carbonates, sulfates or silicates with waters of crystallization.

Experience at this plant would indicate many possible uses for such a magnetic water conditioner. Since installation and sizing are considered critical, you should consult with the manufacturer in solving your water conditioning problem.



Phosphating Tank: Where chipping of scale was such a costly chore, now only hose-downs are required.

Precision Finishing Machine Boosts Shop Versatility

The manufacturer calls it a "new concept" in machine tool building.

Multi-purpose, this precision finishing unit can straight or taper bore, turn, face, chamfer, groove, or ream.

And it's specially built for modest budgets.

▪ Ever heard of a "unitized" finishing machine?

If you haven't, it may be because the machine's new and different. Even the thinking that led to its development is far from conventional.

"The Heald Model O Bore-Matic represents a new concept in precision finishing," according to Heald Machine's L. H. Cousineau.

Highly Versatile — It's a small, multi-purpose machine tool especially designed to provide versatility and economy without sacrifice in accuracy.

It's called a "unitized" finishing machine because it is designed around a number of standard, interchangeable units or "building blocks". It can be set up as a dozen different basic machines with hundreds of combinations in tooling and fixture equipment. And it can perform a wide variety of boring, facing, turning, chamfering, grooving, and similar operations.

For Low Budgets—The new machine is expected to find widest application in the accurate machining of relatively small parts where versatility of use and moderate cost are major considerations.

A major feature of the machine is a radically new multi - spindle unit with miniature precision boringheads. This innovation permits significant savings in time, effort, and expense on a broad range of small work requiring the precision finishing of closely-spaced multiple holes.

Cuts Costs—The multi - spindle unit is expected to increase production rates and lower costs in precision finishing of parts which formerly had to be machined one hole at a time on much larger equipment requiring highly skilled operators.

Thanks to a versatile cluster-head arrangement any required number of holes on close centers can be precision finished simultaneously in a single setup. The operation can be duplicated continuously on a high-speed production basis with extreme accuracy.

Single Package—The Heald development represents a simplification of a pressing problem in industries where precision requirements are growing increasingly complex. It will allow potential users of machine tools to avail themselves of equipment they haven't been able to use previously because of lack of sufficient applica-

VERSATILE: This finishing machine, designed around a number of interchangeable units, is a dozen different machines rolled in one.

tions to justify their investment or because they would have to buy more machine than was needed for a particular job.

Inspiration for developing the concept of a unitized machine stemmed from demands of instrument, aircraft, and guided missile manufacturers for a moderately-priced machine to handle a wide variety of work with high precision. It can be used on any long or short run finishing operation within its capacity range.

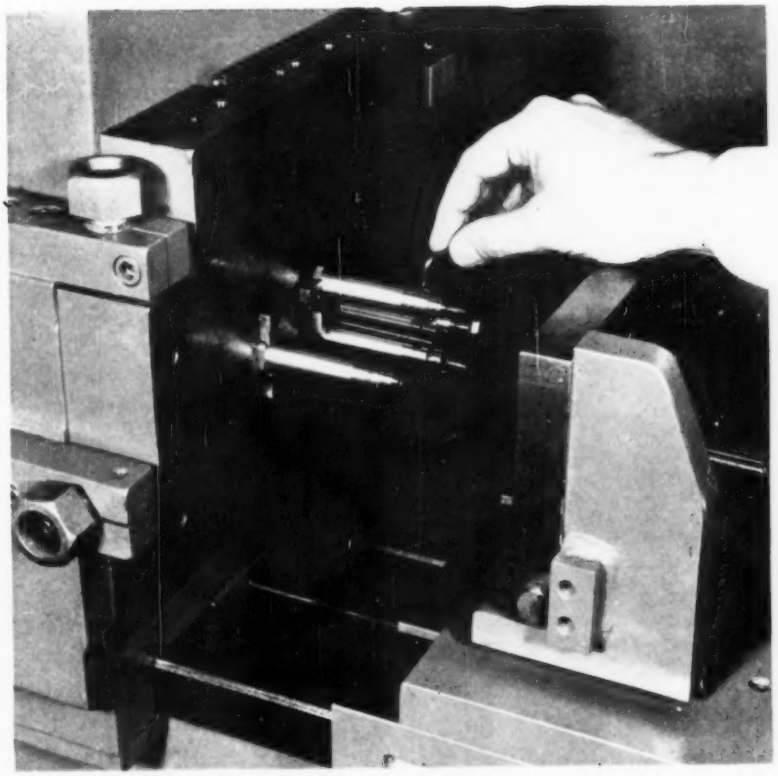
Fits The Future — The user can start with a simple single-end machine that will meet his minimum requirements at low cost. Later, additional units and accessories can be added to enable the machine to handle a wider variety of work, as either a single or double-end machine.

Standard tooling available with the new machine includes a selection of interchangeable boringhead and drive units and manual or hydraulic cross - slide attachments. With them, the user can assemble any number of custom-built setups.

For Perfect Alignment — A selection of standard tooling is now available with the new machine. In addition to the multi-spindle boringheads, there are boringhead and drive units. These come in cast iron frames and mount on either end of baseways. They are keyed between ways and clamped with hold downs for perfect alignment and ease of inter-changeability.

Hydraulic cross feed units, complete with hydraulic operating cylinders and controls, are available for both the standard and multi-spindle boringheads.

Universal Fixture — Swivel boringhead support, for single boringhead units, permit taper boring and turning of rotated work. Hydraulic and manual cross-slides allow for precision horizontal indexing of work or tooling for multiple-hole boring and for generating faces, grooving, and undercutting of rotating work. Universal fixtures are also available.



MAJOR FEATURE: Radically new multi-spindle unit with precision boringheads permits finishing multiple holes on very close centers.

SCALE MODEL: The scale model above shows how users can assemble a wide variety of custom-built setups with a single finishing machine.

Easy-To-Make Reamer Speeds Sizing

Here's a "success story" made right on the production floor.

You can put it to work in your own shop. It's that simple.

This new reamer cut a 2½-hour sizing job down to 5 minutes — and produced a vastly improved surface finish.

Versatile, it machines steel, stainless, and many aluminum alloys.

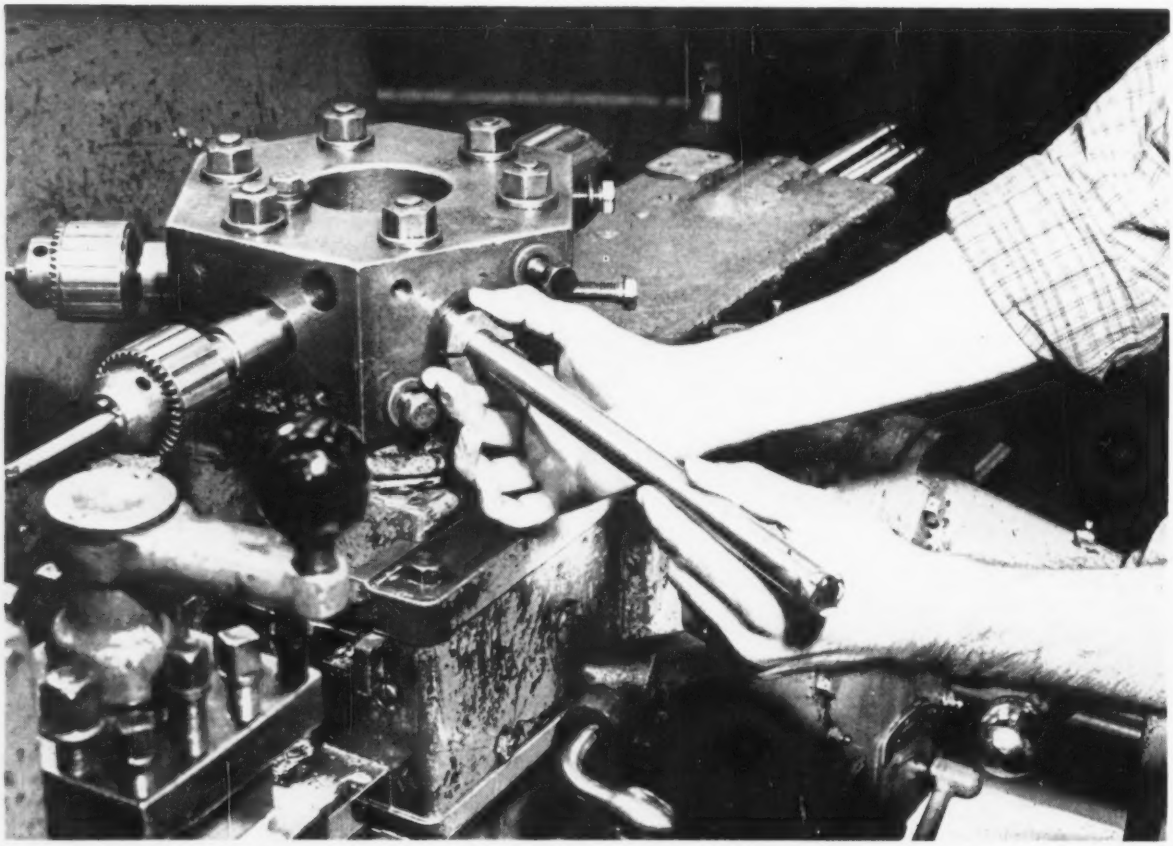
■ Here's a "do-it-yourself" tooling idea that can save you money and a lot of valuable shop time.

It's a simply designed, easy-to-make, carbide-tipped reamer. Developed by The Glenn L. Martin Co., Baltimore, it's being used to ream deep holes in low-alloy steel parts on a highly efficient production basis.

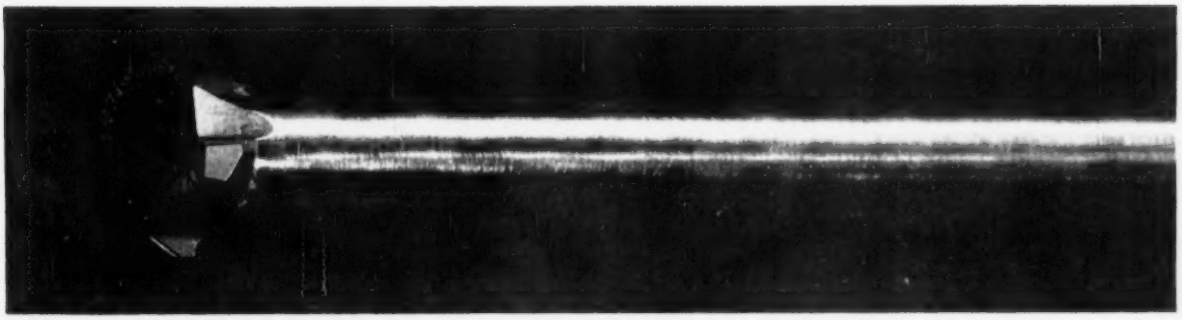
What makes this reaming application tougher than most is the fact that the steel parts are heat treated to 200,000 psi (Rockwell C-42 or higher).

Tough Job — Reaming these hardnesses presents a really difficult production problem for turret lathe operation. So difficult that Martin was spending 2½ hours to size a deep hole in one particular part, prior to honing, in order to maintain finish and size requirements.

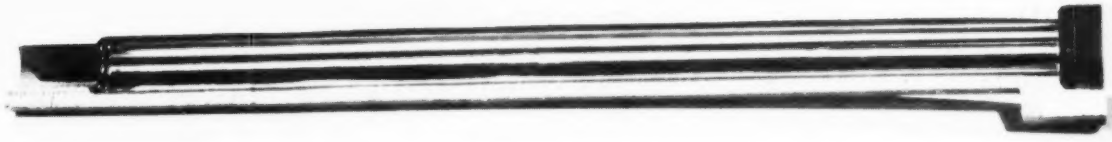
In an attempt to speed the operation, the company decided to ex-



NEW REAMER: High-speed, carbide-tipped, this new tool designed by The Glenn L. Martin Co. actually performs the reaming operation in 1/30th the time required by the conventional steel bore method.



EASY-TO-MAKE: Close-up view of reamer head shows area where cutting tool was brazed to drill rod.



SURFACE FINISH: Half-section of piston shows excellent surface finish obtained with new reamer.

periment with a carbide reamer. The most effective design involved the use of a ¼ in. square carbide blank, silver-soldered to the end of a length of ordinary drill rod.

The four corners of the blank were ground and fluted to simulate a four-lip end mill. Size and length, of course, were adjusted to match hole-size requirements.

Save Time—Since it was necessary to break and wash the chips out through the flutes with a coolant, chip breakers were ground in each cutting edge.

With the new carbide reamer, the time-consuming saddle mounting, boring, and honing have been eliminated. Most important, the part which once required 2½ hours to size is now completed in 5 minutes.

Although originally designed for machining high-hardness steels, the new reamer has also proven to be highly effective for sizing holes in stainless parts. With slightly modified dimensions, it can be used to good advantage on many aluminum alloys.

Here's How—If you'd like to try the new reamer in your own shop, here are the details you'll need to make one:

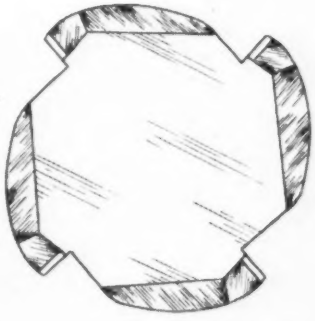
1) Dimensions of the carbide-tipped reamer when used on steels include: lead angle, 35°; radial rake, 0°; primary clearance, 10°; O. D. clearance, 1°; chip breaker, 0.025 x 0.025 in.; grade of carbide, K4H.

2) When used on aluminum alloy, the dimensions are: lead angle, 35°; radial rake, 0°; primary clearance, 10°; O. D. clearance, 1°; chip breaker, none; grade of carbide, 883.

3) The carbide tips are brazed to the shank with "Easy Flo" silver solder, No. 3, using an induction heater. All grinding is done with a 100-grit wheel.

4) When used on steel, the reamer speed is 50 to 300 sfpm, with a 0.007 to 0.018 in. feed. When used on aluminum alloy, the speed is 200 to 300 sfpm, with a 0.012 to 0.025 in. feed.

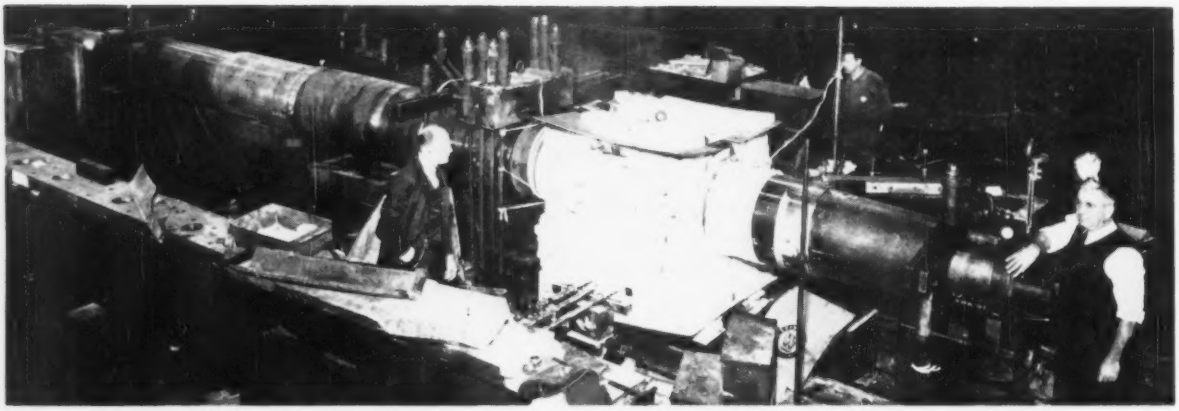
If you're interested in getting a really good surface finish, here's an encouraging note. The finish obtained with the new reamer ranges between 20 to 40 rms. Best results previously obtained ranged from 63 to 100 rms.



WORKING SKETCH: This drawing plus dimensions given in the article give you working details.

The magnitude of all-around improvement more than justifies the almost trifling tooling cost.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.



FURNACE METHOD: With furnace built up around shaft and jacks in position, bending is about to start.

How To Straighten Large Shafts In An Emergency

By **A. C. Mann**—D-C Motor & Generator Engineer and **B. B. Winer**—D-C Mechanical Sect., Large Rotating Apparatus Dept., Westinghouse Electric Corp., East Pittsburgh, Pa.

To have a motor out of commission because of a bent shaft is a costly emergency.

What are you going to do? Replace it and be faced with a long delay in building a new shaft?

Not necessarily, because either of two methods can be used for on-the-spot correction.

▪ Misalignment of a large diameter shaft can occur in a power station, on shipboard, in a manufacturing plant. In such an emergency you must find a quick solution. It comes down to a question of replacing or repairing the shaft you already have.

Replacement turns out to be a very costly operation both in time and money. The manufacture of a new shaft requires special forging and precision machining. Installation problems can be formidable. The time delay must be calculated in months.

What about repairing the shaft? You can use either one of two methods proven successful in the straightening of large shafts. If the shaft has no deep gouges, cracks, or sharp bends, it will have retained nearly all of its strength.

Use furnace heat—One method, particularly useful in cases of large bends, is the furnace method. Furnace heat is applied to the shaft at the location of the bend. Jacking devices are employed to remove the bend from the shaft.

The theory is simple and straightforward. For example the yield point of SAE 1022 steel is 40,000 psi at room temperature, while at 1200°F this is decreased to 10,000 psi. By heating the shaft you don't need as much force to straighten it. At the same time, the stresses induced are limited to the yield point at the elevated temperature. The cooling is done slowly to keep stresses at a low level.

Permanent Correction—Here's an example of a bent motor shaft at a Midwestern steel mill. The bend in a 27-in. diam section caused a runout of more than 3 in. at the coupling flange. After the armature parts were removed, a furnace was built around the bent portion of the shaft, which was supported on a "strongback."

One bend using hydraulic jacks reduced the runout to the point where the remainder of the runout could be removed by machining the journal. This shaft has seen fifteen years further service with no detrimental effects noted.

Spot-heating—A second method calls for heating a small spot on the shaft with a torch or by induction heating. In this method, heat is applied on the outside of the "knee" of the bend. As the metal expands

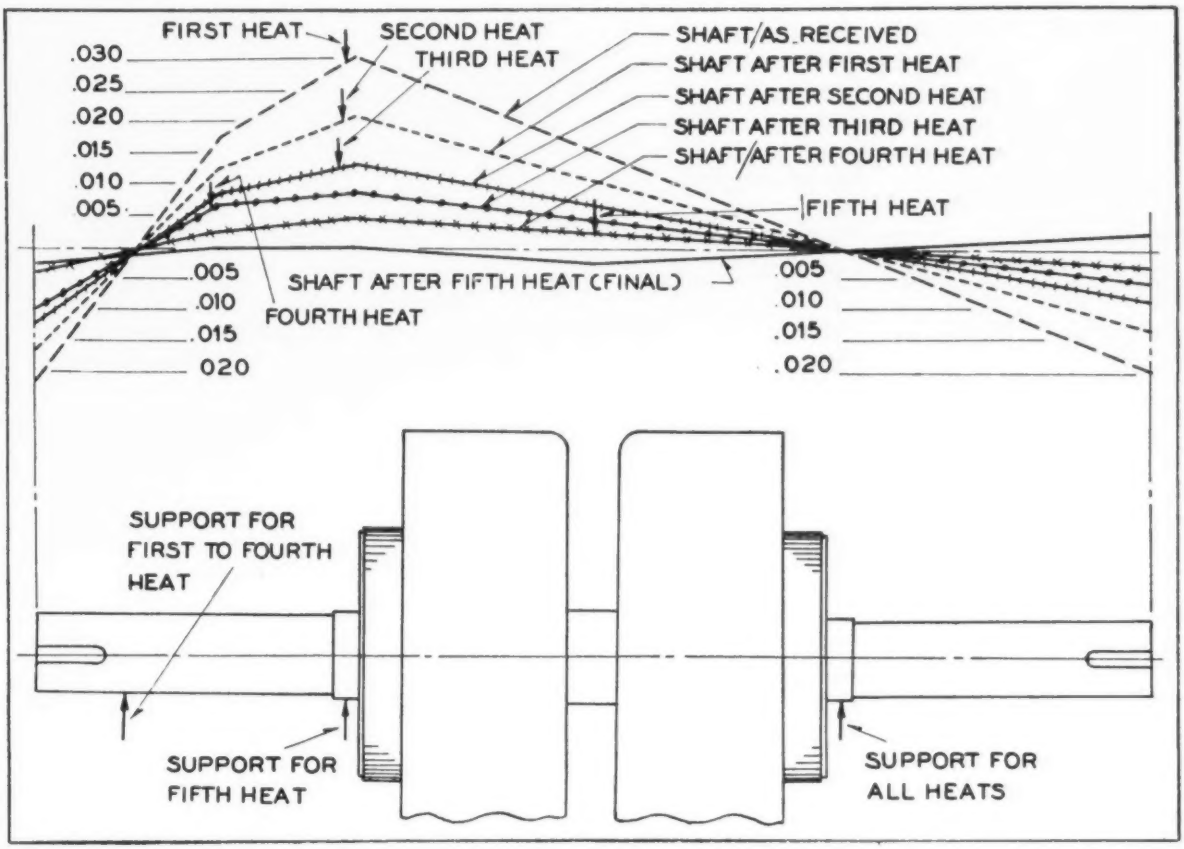


FIG. 1: Eccentricity readings after each heat show reduction in runout when the spot-heating method is used.

due to heat, the bend is increased. The expanding metal is compressed by the restraining effect of the surrounding portions of the shaft. These compressive stresses increase until the yield point in compression is exceeded to cause plastic flow.

When the source of heat is removed, the heated metal shrinks and pulls on the sides of the heated area until the yield point of the material in tension is reached. This shrinkage and pulling reverses the bend caused by the heating. The result is to reduce the original bend.

In one example the spot-heating method was applied to a 30-in. shaft for an Eastern steel mill. In a series of five heats the runout of this shaft was reduced from over 0.100 to 0.002 in. at the coupling end. Fig. 1 shows successive plots of eccentricity readings.

Compare advantages — The furnace method is better in terms of residual stress, because the bending

SPOT-HEATING METHOD: Success depends on the proper location and size of heated spot. Job requires an experienced operator.

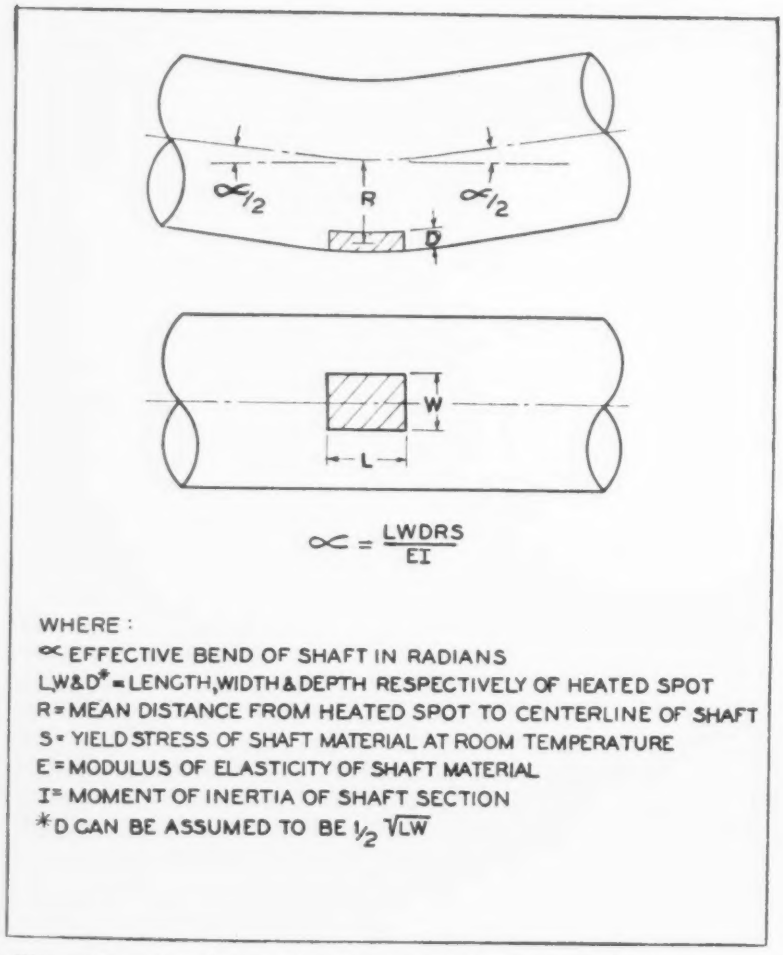

∝/2
R
∝/2
D
W
L
∝ = LWDRS / EI
WHERE :
∝ EFFECTIVE BEND OF SHAFT IN RADIANS
L,W&D* = LENGTH, WIDTH & DEPTH RESPECTIVELY OF HEATED SPOT
R = MEAN DISTANCE FROM HEATED SPOT TO CENTERLINE OF SHAFT
S = YIELD STRESS OF SHAFT MATERIAL AT ROOM TEMPERATURE
E = MODULUS OF ELASTICITY OF SHAFT MATERIAL
I = MOMENT OF INERTIA OF SHAFT SECTION
*D CAN BE ASSUMED TO BE 1/2 √LW

FIG. 2: Formula calculates size of spot to be heated in straightening a bent shaft by the spot-heating method.

takes place with the metal at a low yield point. The resulting stresses are therefore lower. With the spot-heating method, the rapid quenching resulting from the cooling effect of the adjacent metal could cause incipient cracks or hard spots in high alloy steels.

On the other hand the spot-heating technique requires only a welding torch, air hose, and indicators for the whole operation. This is simple compared to the furnace method requiring a furnace to be built in addition to clamps mounted on a "strongback" and large jacks.

The location of the bend is also a factor in the choice of method. If the bend is accessible without removing any of the armature parts, spot-heating can be used to advantage. If the bend is under a spider or hub, you will have to strip the shaft in either case and the furnace method may be used.

Where time is the factor and the bend is not too great, the spot-heating method is quicker. The furnace method entails more preparation and the making of special parts, but larger corrective bends are possible.

Furnace Techniques — Furnace design is a consideration since a heat of about 1200°F should be concentrated in one portion of the shaft. In the example cited, the furnace was constructed of firebrick reinforced with sheet metal and heated with a gas flame. Fourteen hours were required to bring the shaft up to heat.

The "strong-back" and jacking equipment are important in the case of a large shaft. The foundation of the "strong-back" must have a moment of inertia at least of the same order as that of the shaft. The jacks must have a large enough capacity to handle the force required. Two 200-ton jacks were used in the case of the example cited.

Once this equipment has been set up, you just heat the bent section of the shaft to the prescribed temperature and apply force with jacks to bend the shaft the amount needed. Actually you should bend the shaft slightly past the calibrated amount to allow for springback when the jacks are released.

Spot-heating tricks—The size of the spot to be heated and the time of application is dependent on the diameter of the shaft. On a large shaft of 30-in. diam the spot may be 6 to 8 in. to provide the required force. The formula for calculating the size of spot is shown in Fig. 2.

The time of heating is a function of the size of the spot. For a carbon steel shaft, you would continue heating the shaft until a "cherry red" color is obtained indicating 1200°F. For alloy steel shafts lower temperatures will have to be used.

In successive heats runout readings must be taken to give an accurate plot of the shaft. After each heat the shaft must be completely cooled, so that readings can be recorded to locate a new spot if needed. One application of heat may be adequate for minor bends, while larger bends may require a series of spots on a plane through the axis of the shaft.

Local Distortion—In both methods of straightening, you will notice some local distortion at the point of application of heat. If this distortion is on the journal, it must be eliminated before the shaft is put back into operation. Machining of a few thousandths will fix this.

Both these methods should be considered before concluding that replacement is necessary. A successful on-the-spot repair of an existing shaft is a far better way of handling an emergency situation in terms of economy.

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Pneumatic Conveyor

Systems for pneumatic conveying of dry, free-flowing materials are described in an 8-page publication. It details reasons for installing such a system. The brochure shows some successful installations in operation. (U. S. Hoffman Machinery Corp.)

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Shell Molding

Proper procedures for using silicone parting agents in shell molding are presented in a leaflet. Special sections cover several methods of breaking in and cleaning patterns. It discusses the relative advantages and limitations of all types of agents. (Dow Corning Corp.)

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Plastics

To help users choose the right plastic for any job, a revised 1957 edition of the "Condensed Reference File of Bakelite Plastics" has been published. It contains 16 pages. (Bakelite Co.)

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Welding

Tips for design engineers on stud welding are included in a 24-page design manual. (Nelson Stud Welding Div., Gregory Industries, Inc.)

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Industrial Chemicals

Containing 22-pages, a booklet describes an industrial chemicals company and its products. (Harshaw Chemical Co.)

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Pipe Welding

Developments in welding steam-power piping are described in an 8-page publication. (Linde Air Products Co.)

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Hose, Fittings

Condensed, an industrial catalog lists hose, fittings, socketless kits, and self-sealing couplings. It's an abbreviated version of a firm's complete catalog. (Aeroquip Corp.)

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Soft Abrasive Wheel

A data sheet lists benefits of using a soft abrasive wheel. Made

in various grits, the wheel removes flash from diecastings, blends weld spots, removes rust and scale, deburrs, smooths and polishes, etc. (Merit Products, Inc.)

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Tube Assembly

Brazing rings for stainless and high alloy steel tube assembly work are illustrated in a data sheet. It describes features and advantages of the rings and discusses their application. (Wall Colmonoy Corp.)

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Safe Grinding

New concepts in flared cup grinding wheel construction are announced in a bulletin. It describes a setup which prevents accidents by simply making the wheels stronger. With lower breakage, accident rates go down. (Manhattan Rubber Div.)

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Reflecting Signs

Scotchlite signs are illustrated and listed in a full-color bulletin. It shows a complete line of standard or special legend signs available. (Mine Safety Appliance Co.)

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Seamless Tube

Calculated tables in a folder show bursting pressure of seamless steel tubing. It tells how to figure bursting pressure from the tables. (Pacific Tube Co.)

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Booster Pump

Submersible booster pumps are covered in a 4-page folder. (Layne & Bowler Pump Co.)

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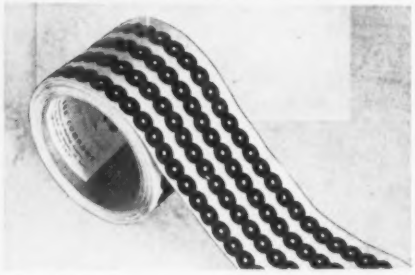

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Zirconium and hafnium are discussed in a new 12-page booklet. It describes their uses, mechanical and physical properties and a sodium process for producing the metals. (U. S. Industrial Chemicals Co.)

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Impervious Graphite

Recommendations for the application of one firm's impervious graphite and its resin base cements in corrosive service appear in a bulletin. (National Carbon Co.)

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Milling Machines

Milling machines equipped with power feed are described in a 4-page folder. The unit mills horizontally, mills vertically and drills. (Benchmaster Mfg. Co.)

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Heavy Equipment

A company publication reviews the progress made by heavy industrial equipment during the past three decades. It starts with the high-speed diesel engine and brings the reader up to date on some of today's modern equipment. (Twin Disc Clutch Co.)

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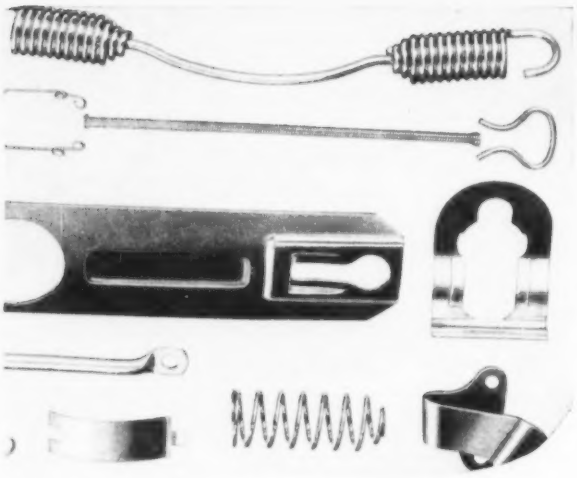

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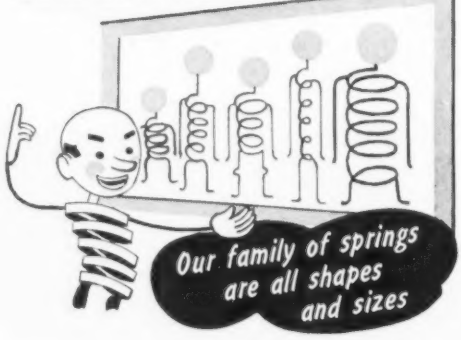

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Time and labor saving features of adjustable bed hydraulic gap presses are described in a new bulletin. Presses are hand-air-oil and motor operated; of 15 and 25 tons capacity. (K. R. Wilson, Inc.)

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Punch Presses

Five-ton electro safe punch processes appear in a data sheet. It describes them as exceptionally safe, versatile and rugged. The literature covers: safety features, controls, construction and specifications. (Kenco Mfg. Co.)

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Fabrication

How a job shop can solve some of your metal fabrication problems is told on a dozen-page brochure. It introduces the firm's facilities for engineering, production, finishing, assembly and even packaging. (The Plume & Atwood Mfg. Co.)

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Induction Heating

Motor-generator sets and accessories for induction heating appear in a bulletin. It also discusses set cooling systems. (Westinghouse Electric Corp.)

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Materials Handling

How to cut materials handling costs is told in a 34-page report. It includes illustrated case history studies on use of welded wire mesh containers. Also contained is general information covering the containers versatility in shipping, warehousing or production. (Pittsburgh Steel Co.)

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Oxide Cutting Tools

Oxide cutting tools are described in a dozen page catalog. It explains how a high strength, high density aluminum oxide cutter performs on metal cutting jobs. Also covered: tool holders, listing of blanks. (Stupakoff Div., The Carborundum Co.)

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Leaded Steel

Leaded alloy steel is discussed in a bulletin. It explains how a chromium-molybdenum .40 carbon alloy steel can boost parts machining output to 200-pct. Other advantages claimed: long tool life, close tolerances, very good finish. (Joseph T. Ryerson & Son, Inc.)

For free copy circle No. 27 on postcard

Plastic-Metal Tube

"Pick it up. Try to break it. Twist it. Pull it. Bite it." So advises a data sheet describing a tough new tubing. And you can test the tube yourself; a sample is attached. (Newage Industries Inc.)

For free copy circle No. 28 on postcard

Chrome Plating

A price guide brochure lets you actually test a firm's surface active agents in chrome plating solutions. Samples of the material are included in pill form. (Udylite Corp.)

For free copy circle No. 29 on postcard

Squaring Shears

Underdrive power squaring shears are described in a 74-page bulletin. It illustrates such features of the shears as a multi-jaw sleeve clutch; rigid, box type construction; self-compensating holddown; fully enclosed drive; low outline for complete visibility; four cutting edge

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 5/2/57

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FIRST CLASS PERMIT No. 36 (Sec. 349 P.L.&R.) New York, N. Y.

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FREE LITERATURE

knives and self-measuring back gage. Shearing capacities range from 16 gage to 1-in. mild steel and cutting lengths from 4 to 20 ft. (Niagara Machine & Tool Works)

For free copy circle No. 30 on postcard

Control Valves

Two specification sheets detail construction of single-seated and double-seated diaphragm control valves. These pneumatically-operated valves control the flow of liquids, gases and steam under a wide range of operating conditions. (Minneapolis-Honeywell Regulator Co.)

For free copy circle No. 31 on postcard

Precision Balls

Precision balls and their manufacture are described in a folder. The balls can be made from: chrome alloy steel; stainless steel; vacuum-melt metals; Monel; brass, bronze and beryllium copper; aluminum; solar steel; high-temperature steels; sintered carbides; stellite; ceramics and synthetic sapphire; other non-metallics or many special materials. (Universal Ball Co.)

For free copy circle No. 32 on postcard

Laminates

Vinyl-to-metals laminates are described in a 4-page brochure. Even the stress of machining doesn't impair the colorful, protective laminates. They can be bent, drilled, punched, drawn, sheared, spot or stud welded without harming the texture or color of the vinyl. (North East Laminates, Inc.)

For free copy circle No. 33 on postcard

Surface Active Agents

Surface active agents are subjects of a major bulletin. It gives technical data on seven types of "Aerosol" surface agents, including their use in basic formulations, data for testing effectiveness and information on storage and handling. A section deals with surface action agents in the ores and slags fields. (American Cyanamid Co.).

For free copy circle No. 34 on postcard

Fork Trucks

Electric fork trucks are the subjects of an 8-page publication. It covers four major components of electric trucks: control circuit, power train, hydraulic system and upright assembly. (Clark Equipment Co.)

For free copy circle No. 35 on postcard

Stainless Actuator

Designed to operate within a temperature range from —67°F to +600°F, a new all-stainless steel actuator is described in a firm's engineering data. The actuator is hydraulically operated over a range of pressures from 0 to 3000 psi. (Ex-Cell-O Corp.)

For free copy circle No. 36 on postcard

Pipe-joining

Offset rolls and a gage that reduce industrial pipe and elbow edging to a single operation appear in a bulletin. Available for both hand and power rotary combination machines, they cut pipe-joining time in half, the publication states. (Niagara Machine & Tool Works.)

For free copy circle No. 37 on postcard

Screw Machine

Automatic screw machines appear in a 12-page illustrated catalog. It offers specifications and operation features of this machine. The unit comes in three different capacities to take stock to ¾, 1¼ or 1½-in. diam. (Brown & Sharpe Mfg. Co.)

For free copy circle No. 38 on postcard

Safety Switch

For light-duty, a double-throw safety switch is covered in a bulletin. The switch permits connection of emergency or standby power during storms. (General Electric Co.).

For free copy circle No. 39 on postcard

Make sure you're buying right

See PROGRESSIVE for parts like these

Progressive is saving its customers up to 70% on special fasteners. Very likely we can save you thousands of dollars on many of your small metal components.

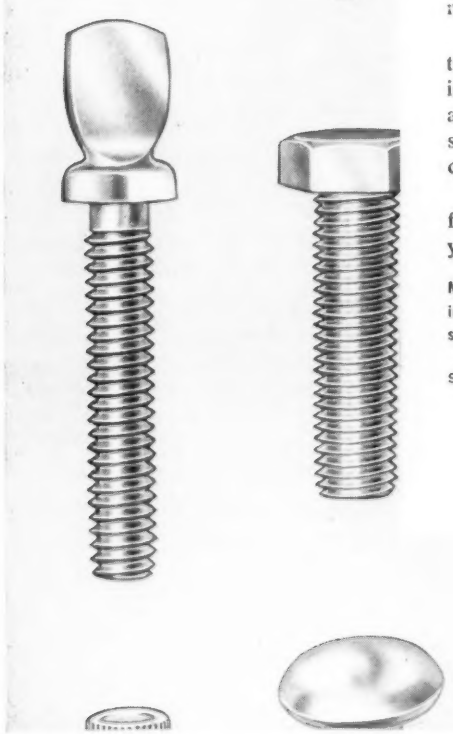
On parts such as these, Progressive's cold forming method is superior to other fabricating techniques. Scrap is eliminated because the metal is formed into shape, not machined away as expensive scrap. Primary and secondary operations may be combined more readily to effect savings in machine time and between-machine materials handling. Work quality is just as you want it — we won't let it out unless it is.

You may have parts right now that our engineers could value analyze for you. Send us the prints. A Progressive quote is a sure indicator that you are buying right!

Machine screws and special fasteners are our business . . .
including square and hexagon machine screw nuts, Sems fasteners,
slotted tapping screws and Phillips Head Screws

STANDARDS AND SPECIALS CUSTOMIZED FOR YOUR NEEDS

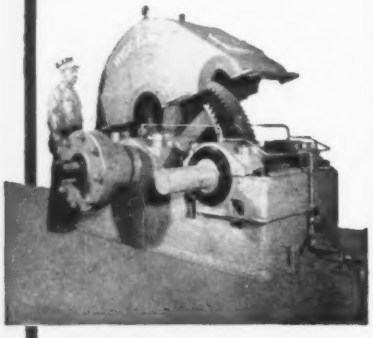
THE PROGRESSIVE MFG. CO.
Division of The Torrington Company
78 Norwood Street, Torrington, Connecticut



Hyde Park
RED CIRCLE Rolls ALLOY-CHILLED

Gray Iron Castings

Hyde Park Castings up to 80,000 pounds are sound, accurate and physically dependable.
Precision machining is done by skilled craftsmen in our modern machine shop.
Send your blue prints for quotation.



Mill Drive

Machine Castings
Lathe Beds
Housings
Pinion Housings
Mill Housings
Shoe Plates
Layout Plates
Surface Plates

For finer finish, long life and greater tonnage, specify Red Circle Rolls.

Hyde Park
FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland County, Pa.
ROLLS
ROLLING MILL MACHINERY
GREY IRON CASTINGS

Parts Maker Fills His Stock, Then Orders

Making parts for stock, not customer orders, lets a firm turn out items based on accurate forecasts.

It speeds order delivery, too. Using a unique production setup, one maker first fills his racks, then quickly fills orders.

Communication's the key.

▪ Making all parts for stock rather than order is the philosophy of one manufacturer. This lets the company turn out its parts based on sales forecasts and market analysis, rather than on customer orders. It permits considerable decreases in delivery times for particular customer orders and affords more even plant loading throughout a year.

All manufactured pieces at Reliance Electric & Engineering Co.'s No. 3 Plant at Ashtabula, Ohio, are produced as stock parts rather than as portions of particular electric motors. When complete, the firm stores the items in flow-type storage bins adjacent to the assembly area. Here, they are removed as required. Once taken from stock, a part moves only by power conveyor toward final assembly. It never returns to stock.

Gravity Feed—Workers place all parts in the flow bin from the rear; these items then move by gravity feed to the front where they are used on a first-in, first-out basis. Separate racks for every modification insure flexibility in meeting orders.

To avoid costly errors, the firm stamps all parts with a number. Workers store them by number at the assembly areas. On removal from stock, a code indicates the type motor with which the part is to be used. These numbers also give the production control department a running tally of parts made, aiding inventory control.

Order Comes In—When a customer order comes in, it's processed to five assembly areas by production control men. These areas begin work simultaneously producing sub-assemblies. At the final assembly and finishing area, all these sub-assemblies meet.

From here, all stations get signal to assemble parts for order.

Following winding at one operation, coils move by overhead con-

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 113. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

veyor to the stator assembly department. Here they join to the stator cores coming from stock. After the

Stator line operator gets signal and puts correct frame on line.

coils connect and checkers test the stator, they continue to the varnish department.

All Mechanized—In a completely automatic process, the stators get two dips and insulating varnish bakes and then a finish sealing dip. For special application — where items need more than two dips and bakes—an employee places a small metal square over the stator. This metal piece interrupts the photoelectric circuit controlling the finishing dip, making that dip inoperative for the particular piece. The stator then re-runs through the dip and bake operation as many times as necessary. On the last re-run, the worker removes the metal square and the stator automatically receives the sealing dip.

During the dip and bake operation, the operator records the job numbers in process on a TelAutograph. This automatically sends these numbers to the other five assembly areas. This procedure notifies them that the stators have reached that point. Most important it tells them the stator will remain in the original sequence for the balance of the manufacturing cycle.

All the sub-assemblies and parts for a particular customer's order

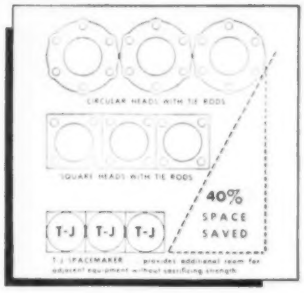
all the EXTRAS are standard with

T-J Spacemaker CYLINDERS

Member of the National Fluid Power Association

- NEW *exclusive* ingenious cushion designs . . . Super Cushion Flexible Seals for Air . . . New Self-Aligning Master Cushion for Oil.
- STRONGER than outmoded tie rod design, proven through actual tests. No tie rods to stretch.
- SOLID STEEL HEADS throughout the full line.
- COMPACT DESIGN eliminates tie rods, increasing the strength and reducing mounting space required, providing extra room for adjacent equipment.
- HARD CHROME PLATED body bores and piston rods . . . assure you of long trouble-free service. (Standard at no extra cost.)
- METALLIC ROD SCRAPER, not just a wiper, actually removes foreign matter from the rod.
- PILOTED PACKING GLAND with extra long bearing. Additional strength and support to the piston rod.
- OIL pressure to 750 p.s.i. AIR to 200 p.s.i.

DELIVERY OFF THE SHELF!



You *save 40% space* when you switch from outmoded tie rod cylinders to the T-J Spacemaker! It's stronger, too! Fits right into automation programs in countless plants. Delivers top performance and dependability with a big *plus* in advanced features. Wide range of styles, capacities . . . reduces man-hours and costs in all kinds of push-pull-lift jobs. Off-shelf delivery in 64,000 combinations!

NEW LITERATURE—Send today for new Catalog SM56 with complete engineering details on Spacemaker line. Write The Tomkins-Johnson Co., Jackson, Mich.

T-J TOMKINS-JOHNSON
RIVITORS...AIR AND HYDRAULIC CYLINDERS...CUTTERS...CLINCHORS

DURASPUN

20-FOOT FURNACE ROLLS
Centrifugally Cast

. . . of Duraloy HH Alloy, one of the most widely used high chrome, medium nickel alloys.

Two items concerning these furnace rolls may be of particular interest:

a—the size: 20 feet long—14" OD, ¾" wall thickness

b—welding operations by which reducing cones and shafts (both statically cast of the same alloy) were welded to the centrifugally cast rolls

These two items will serve to emphasize two phases of our service: (1) the large size centrifugally cast tubes we are able to produce and (2) our machining and finishing facilities, including welding.

Our new 16-page general Bulletin — 3354-G — gives complete details. Would you like a copy? When writing or calling would you mind telling us the general nature of your high alloy casting requirements? Better yet, if you have specific requirements on which we could help, let us have the details.

THE DURALOY COMPANY
OFFICE AND PLANT: Scottdale, Pa.
EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
DETROIT OFFICE: 23506 Woodward Avenue, Pleasant Ridge, Mich.
CHICAGO OFFICE: 332 South Michigan Avenue

arrive at exactly the right time, and in exactly the right order for final assembly.

The motors are assembled on the pallet containing the stator and frame, with the rotor pallet returned by overhead conveyor for re-use.

Setup Rapidly Checks Individual Sheets

Automatic inspection for thickness of individual tin plate sheets takes place at the rate of 60 to 100 per minute at the Youngstown Sheet and Tube plant in East Chicago.

This equipment checks thickness of separate sheets "on the fly" as they feed off a conveyor belt. No measuring unit touches the sheets and no "memory" device is necessary. The gauge pinpoints the substandard sheet.

Scans Sheets—A radiation thickness gauge scans each sheet and makes possible withdrawal of the individual sheet found to be off-tolerance. The gauges and classifiers are made by Industrial Gauges Corp., West Englewood, N. J.

The setup works so rapidly that a thickness indicator can not be read with it. Therefore, it uses a special system to tell the operator the thickness of sheets rejected and passed.

Misses Gaps — The installation works on sheets with a minimum length of 16 in. and a maximum of 45 in., and a range of thickness from 0.006 to 0.019 in. Gaps between the sheets on the conveyor do not affect the operation.

Propose Rivet Standard

A proposed standard on semi-tubular rivets is in preparation. The American Society of Mechanical Engineers is currently preparing it to cover body diameter and head dimensions for three head styles of

You buy near-perfection when you specify this Jessop steel

If you visit the Jessop Specialties Division, you'll be immediately impressed with the clean, quiet lab-like atmosphere, the intensity of effort and care that personifies true craftsmanship. For here Jessop processes fine *Truform* oil or *Windsor* air hardening tool steel into one of its top products . . . precision ground flat stock used for the production of highly accurate dies, gages, cutters, machine parts, straight edges or the like. This Jessop product comes as close to perfection as the steelmaker's art logically allows. Each piece, of any size, is highly-finished, dead flat and square, and guaranteed to have a thickness tolerance of plus or minus .001 and a width tolerance of plus .005, minus .000. An inspector double checks the analysis with a delicate Magnetic Analysis Production Comparator and a Profilometer is used for inspection of the finish. After all tests are passed, the stock is carefully wrapped for shipment to Jessop customers all over the world. If you have any application for this type of product, it will pay you to send in an inquiry. Jessop's pride of accomplishment will make it a better buy for you.

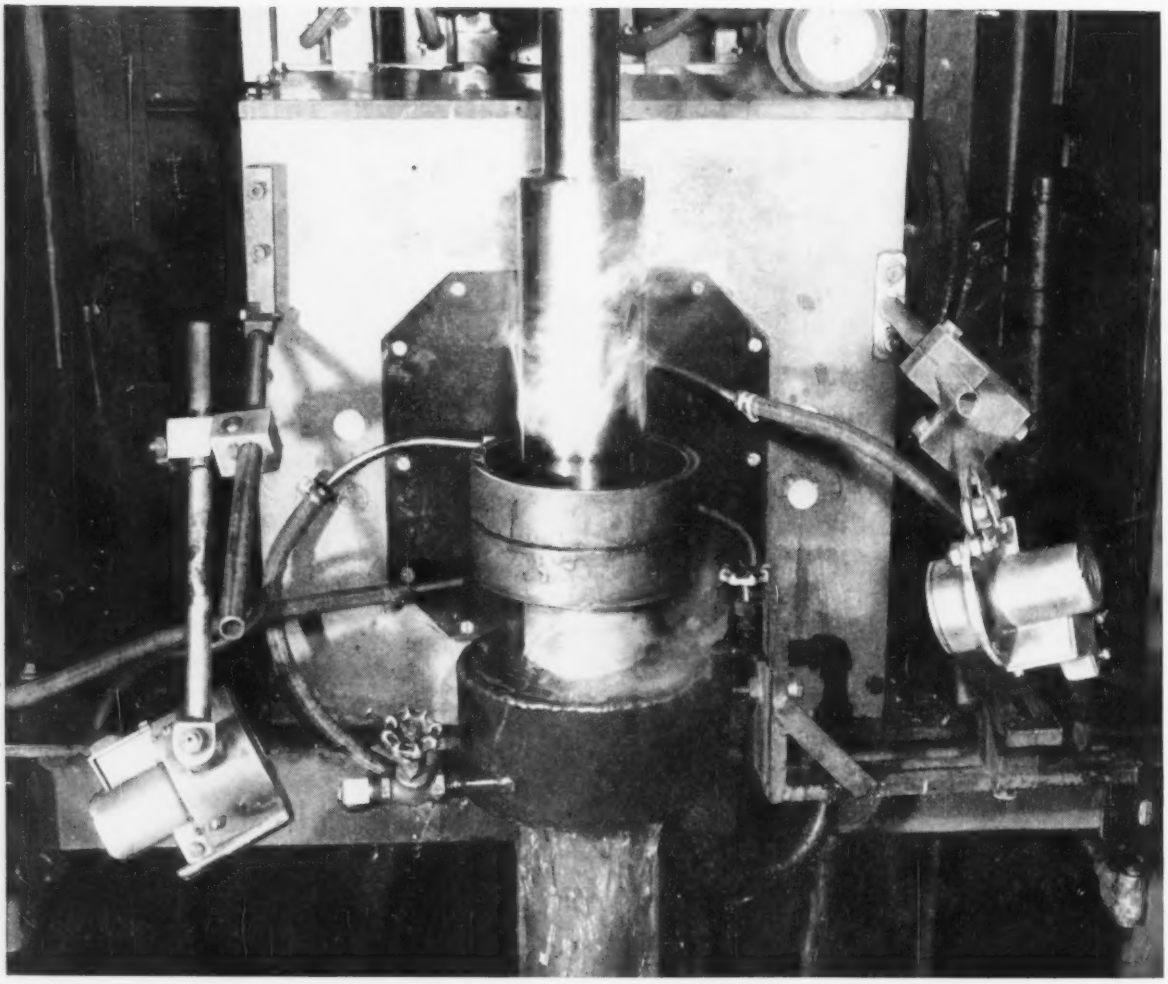
JESSOP

STEEL COMPANY • WASHINGTON, PA.

OFFICES IN PRINCIPAL CITIES

Jessop Steel of Canada Limited, Wallaceburg, Toronto

Jessop Steel International Corp., Chrysler Building, New York, New York



Soaking up heat radiation...

. . . these two L&N Rayotube® detectors are helping McKay Machine Company induction-harden bodies of leveller rolls. About four years ago, this manufacturer of sheet, tin and strip mill equipment switched to full time induction hardening of these shafts which range from 7/8" to 12" in diameter and up to 12' long. The new method doubled production . . . eliminated warpage . . . and provided scale-free hardening. And, in addition, the use of L&N temperature control enabled the McKay Machine Co. to reduce setup time . . . eliminate trial runs . . . and produce the same results heat after heat.

The temperature regulating equipment consists of Speedomax®-Rayotube control on each of two 3000-cycle induction generators having a maximum capacity of 400 kw. One Speedomax in combination with a Rayotube detector controls work temperature by operating a motor-operated rheostat to regulate power input to the induction coil. For quality control, a second Speedomax-Rayotube combination measures and records quench temperature while a third Speedomax provides a record of work speed through the coil.

To find out how L&N temperature control may help increase the efficiency of your induction heating, contact your nearest L&N sales office or write 4956 Stenton Ave., Phila. 44, Pa.

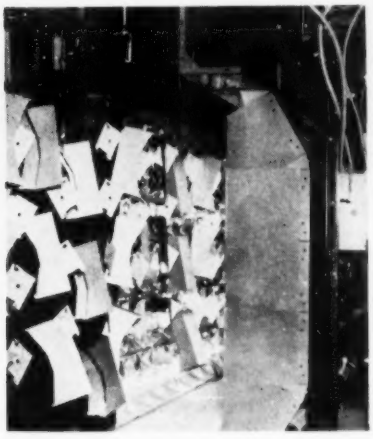
LEEDS Instruments NORTHRUP Automatic Controls • Furnaces

the rivets. These are: oval, truss and flat countersunk heads. Those interested can get copies of the tentative draft free by addressing Frank Philippbar, Standards Dept., ASME, 29 W. 39th St., New York 18.

Finishes Parts Fast As Can Spray Them

Versatile methods enable a New England manufacturer to finish metal parts almost as fast as they can be sprayed. The technique keeps production lines rolling smoothly. It facilitates the handling of rush orders involving special models.

Heart and soul of the new system are a modern infrared oven and an overhead conveyor. The latter passes directly behind the



Here, an overhead conveyor carries parts into the oven.

company's spray booths. The radiant oven, a product of The Fostoria Pressed Steel Corp., Fostoria, Ohio, sends painted steel cases and other metal parts to the assembly line only 15 minutes after forming.

Sprays Parts—Immediately following degreasing operations, shop trucks transport metal components directly to three water-wash spray booths. Here, the firm sprays the metal parts; then workers hang them in the finishing conveyor.

"FAIRFIELD for FINE GEARS"

WHAT **FAIRFIELD**
Facilities CAN MEAN TO YOU

1. **MASS PRODUCTION ECONOMY**—Large or small, you get the benefits of high production rates and big volume output at Fairfield—where fine gears are produced to meet your specifications EFFICIENTLY, ECONOMICALLY!
2. **QUALITY PLUS**—There is no finer recommendation for the quality of the product you sell than to be able to say it is "EQUIPPED WITH FAIRFIELD GEARS!"
3. **DEPENDABLE SOURCE OF SUPPLY**—Fairfield is one of America's largest independent producers of precision-made, automotive type gears for leading builders of construction, agricultural, industrial, marine, and automotive equipment.
4. **BACKED BY EXPERIENCE**—Unexcelled facilities in an ultramodern plant backed by more than thirty-five years' experience in producing Spur, Herringbone, Spiral Bevel, Straight Bevel, Hypoid, Zerol, Worms and Worm Gears, Splined Shafts, and Differentials to customer's specifications.
5. **ENGINEERING SERVICE**—Fairfield engineers are qualified to make expert recommendations on your gear production requirements. *Your inquiry will receive prompt attention.*

FAIRFIELD
MANUFACTURING CO.

for FINE GEARS

2319 S. Concord Rd.

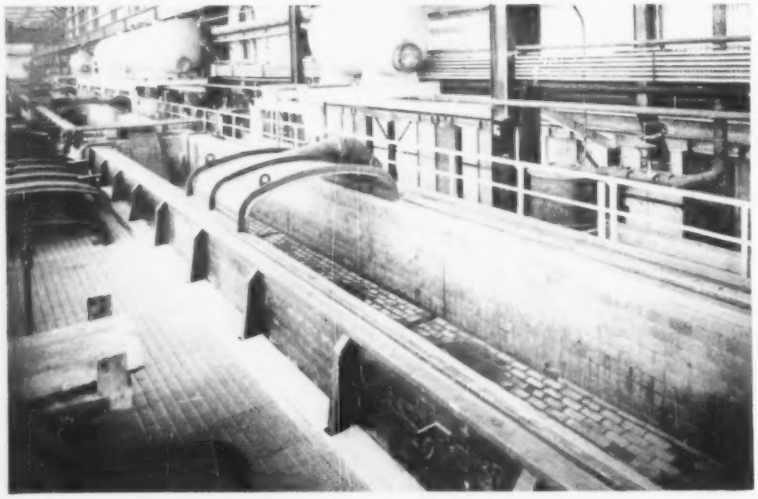
Lafayette, Indiana

the BIG difference

BETWEEN

AVERAGE and ATLAS

PICKLE-TANK CONSTRUCTION



...EXPERIENCE!

Since Atlas installed the first continuous brick-lined pickler in 1933, more than 10,000,000 pounds of Atlas corrosion-proof materials of construction have been used to build all types and styles of pickling tanks throughout the world. The huge pickling tank pictured above was recently installed in a large eastern steel mill and is a typical example of Atlas design and construction in the metalworking field.

Experience has taught us a successful pickling tank requires an integrated combination of highest quality materials, tested and proven design, expert and craftsman-like construction. Only Atlas offers such a service ...a sole source of responsibility, standing behind their installation, controlling every step of the job, from the basic manufacture of the products to the final use of the material.

Why choose the average when you can benefit from the BIG difference of an Atlas pickling tank? One that will be a permanent asset ... deliver full service ... withstand the rugged abuse of modern pickling operations and not be hampered by down-time for repair of corrosion damage. Make sure you specify ATLAS for your next installation.

Write for Bulletin CC-3 giving complete information on the Atlas line.

ATLAS MINERAL PRODUCTS COMPANY
MERTZTOWN, PENNSYLVANIA

The conveyor's hangers set on 6-inch centers. "Set-up" takes place during a 5 to 10-minute trip from the spray booths to the 18½-ft long heating "tunnel" of the infrared oven.

Finish baking takes five to nine minutes as the parts travel through the radiant oven. Operators can control temperature in any baking zone to produce the exact temperature-time cycle necessary for any series of components.

Bakes Them—The oven is 22-ft long, 6½-ft high, and 41-in. wide at oven center. Operating load is 75 kw. Baking usually takes place at a temperature between 300 and 375°F. This depends on the conveyor speed which is widely variable. Of course, the kind of finish being sprayed also influences it.

The firm, Automatic Radio Mfg. Co., Inc., Boston, Mass., makes electronic equipment and radios.

White Floors Popular

Industry is going color conscious. In addition to pastel walls, plants are using more and more white floors. These offer two assets. They are clean and light reflecting; are also usually resilient.

White flooring, reports Hercules Flooring Co. of New York, changes drab factory interiors to clean, comfortable areas. This results in increased manufacturing efficiency.

Research by the Flintkote Co. and Union Carbide & Carbon Co. has developed resisient white floor materials now installed in over 10,000,000 sq ft of plant area.

Ends Pollution Puzzle

Pollution problems are vexing. However, they aren't impossible to solve. So discovers a group of companies who are financing installa-

tion of an experimental process for eliminating waste-acid discharges from steel mills.

An optimistic report to the Ohio River Valley Water Sanitation Commission points out that the $500,000 unit for treating pickling liquor may solve one of the oldest and most complex problems in the Ohio Valley. If so, it will stop an estimated 600-million gal of pickle liquor from discharging into streams.

The installation, at Niles, Ohio, is jointly financed by a group of seven companies represented on the commission's Steel Industry Action Committee and by Blaw-Knox Co.

Team Up on Iron Ore Reduction Process

Two large metals companies are teaming up to make use of a direct reduction process for treatment of low-grade and high grade iron ores. The technique produces high-metallic iron feed materials for use in blast furnaces, electric, openhearth and cupola furnaces.

The firm's, Republic Steel Corp. and National Lead Co., have just announced the formation of R-N Corp. which developed the process. The new organization is owned jointly by the two companies.

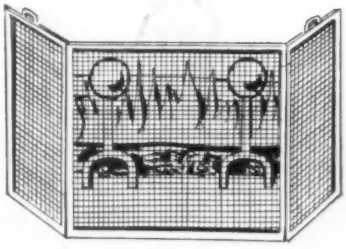
Lay Groundwork—The process was originally devised by National Lead in its research and development work on separation of iron and titanium from titaniferous ores. A pilot plant, constructed in 1954 at Republic's Spaulding mine near Birmington, Ala., has been producing high-metallic iron stock in quantities sufficient for commercial testing purposes.

The high-grade products for open hearth, electric or cupola furnace feed come as briquets weighing from 5 to 25-lb. The blast furnace grade's made as conventional peach-seed briquets. However, if desirable, larger briquets may be produced.

Its Advantages—Principal advantages claimed for the process

in making fine textiles

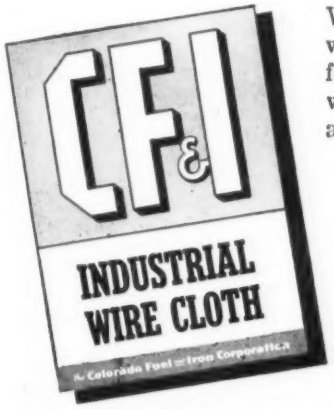
or preventing fires



you'll find...

CF&I INDUSTRIAL WIRE CLOTH

Versatility is another name for CF&I Industrial Wire Cloth. A special tinned version of it is used to gather lint in the manufacture of fine textiles. Another type is used to confine troublesome sparks to the safety of the fireplace. And chances are that you're using—or could be using—it to good advantage in your operation.



Why not get complete details on the wide variety of weaves, meshes and ferrous and non-ferrous metals in which CF&I Industrial Wire Cloth is available? Write today for Catalog.

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver El Paso • Ft. Worth • Houston • Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo Salt Lake City • San Antonio • San Francisco • Seattle • Spokane • Wichita

WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia

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CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

4335

are: (1) It treats a wide range of both non-magnetic and magnetic iron ores, yielding high metallic iron content product of uniform composition, low in impurity; (2) Ready, available, low-grade, solid carbonaceous fuels may be used, regardless of coking properties or sulphur content; and (3) Phosphorus contained in original ore is largely rejected.

Reduces Machine Tool Changeover Time

Solar Aircraft Co. of Des Moines, Iowa, reports that it reduces tool changeover time by 1000-pct and maintains high quality cuts by using Carmet CA-606 throw-away inserts.

The firm uses five throw-away inserts on a turret lathe to machine spacers for the J-57 jet engine. The lathe runs at 83 rpm, cutting from 600 to 700 surface feet per minute. Spacers have a maximum hardness of Brinell 241.

Speeds Up Change — Tool replacement with brazed tools took 20 minutes. Machinists now complete the change-over with the inserts in about two minutes merely by rotating the insert.

On this operation the turret (right) holds two inserts.

The CA-600 series uses a new anti-cratering ingredient called "Crystalloy" which was developed by the carbide producing facility of Allegheny Ludlum Steel Corp. This is a method of using pure titanium metal sponge as a raw material instead of the oxide. The results give a mixed crystal free from oxygen; it therefore doesn't weaken the finished carbide.

Fights Metal Fires

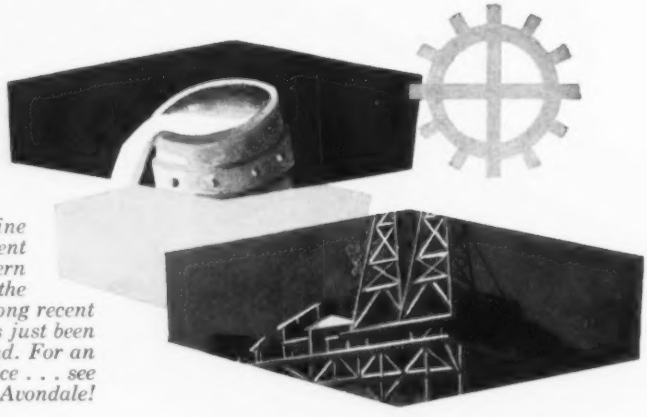
Using dry powder, a piped fire extinguishing system developed by Ansul Chemical Co., Marinette, Wis., fights metal fires in areas where use of manual extinguishers is impossible. Such a situation might exist due to radiation hazards or because of the dense, caustic smoke characteristic of liquid-metal fires. The firefighter is said to be especially effective on such liquid metals as sodium. Manual operation or heat-actuating devices start it working.

a better Foundry service for you . . .

SERVICE FOUNDRY

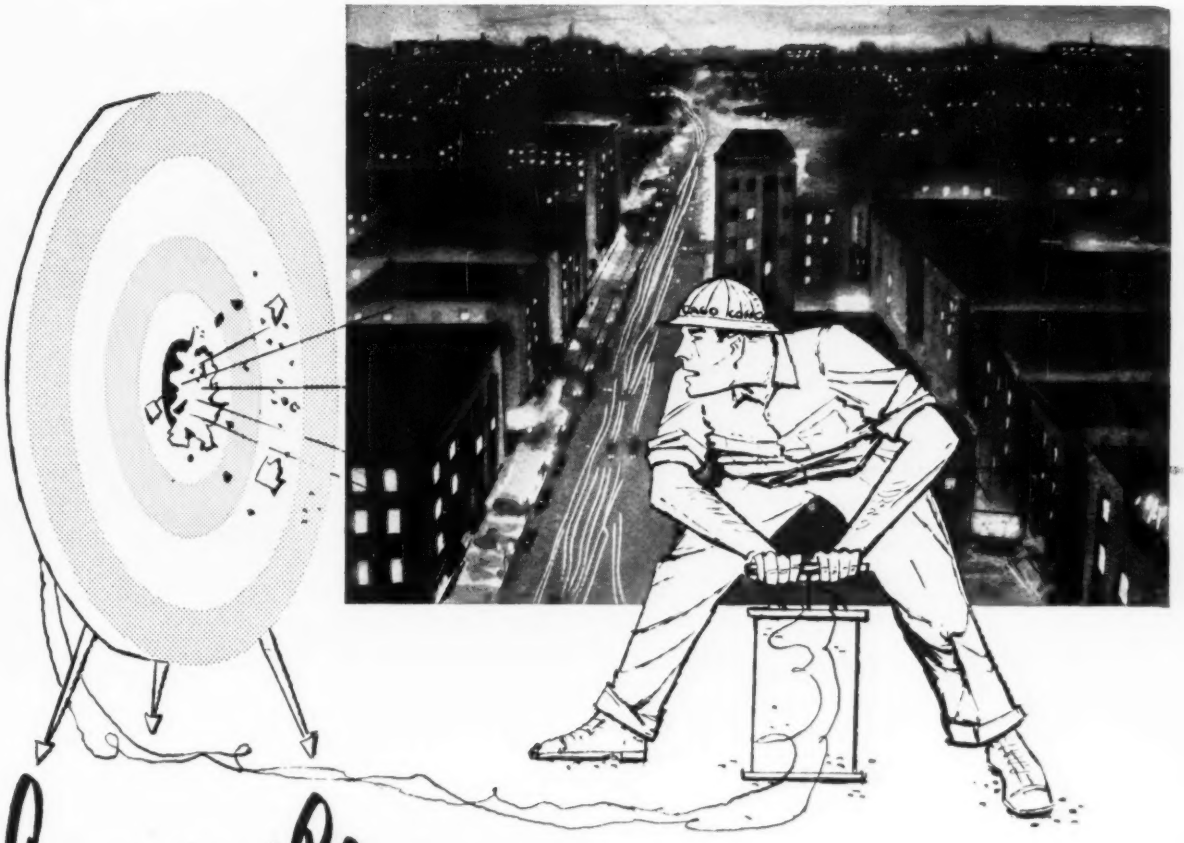
A DIVISION OF AVONDALE MARINE WAYS, INC.

Foundries have come a long way since the forge and bellows . . . today they are mechanized and specialized, offering a wide variety of products and services including engineering and design. This is certainly true of SERVICE FOUNDRY, a division of Avondale Marine Ways, Inc. In addition to a complete foundry and machine shop service, there is a large and competent staff of engineers, draftsmen, and pattern makers highly skilled in meeting the requirements of your industry. Among recent improvements, a new electric furnace has just been installed—the most modern of its kind. For an all-around better foundry service . . . see Avondale!



SERVICE FOUNDRY a division of Avondale Marine Ways, Inc.

416 Erato St. New Orleans, La. CAnal 3836



Controlled Blasting SAFE-GUARDS "light" FOR AN ENTIRE CITY

With better than an 80% increase in the consumption of electric power, the far-sighted engineers of a large mid-western electric power and light company decided that an addition to their main generator building was necessary. To do so meant first removing a 24" thick wall that measured 210' long by 31' high. Removing this wall in the formerly-conventional methods would not only have taken too long, but would have cost a great deal.

At this point CHICAGO CONCRETE BREAKING COMPANY'S demolition experts were called in. The question put to them: "Could dynamite be used safely on a wall that was less than five feet from operating equipment . . . equipment that meant power and light for an entire city?" The answer: CHICAGO CONCRETE BREAKING not only could guarantee to do the job of removing that wall, but would do so without disturbing the operation of that vital equipment.

In less than three weeks over 12,600 cubic feet of concrete wall was control-blasted out. A tremendous savings in time and at a cost that was but one-third of what the "old" methods would have been . . . with absolute safety to both men and equipment . . . such were the dividends that CHICAGO CONCRETE BREAKING returned to those modern-minded engineers.

If you have any rehabilitation work coming up — regardless of how complex or "tricky" it appears, phone or write today. Our 35 years of experience, know-how and ability are at your command to handle your demolition work while safeguarding your vital equipment . . . as we did in the above situation.

CHICAGO CONCRETE BREAKING CO.

EDWARD GRAY, PRESIDENT

12233 S. AVENUE "O", Chicago 33, Ill., BAyport 1-8400 **PITTSBURGH AREA - 213 Corey Ave., Braddock, Pa., Electric 1-1656**

SERVING THE PRIMARY METALS AND OIL INDUSTRIES WITH KNOW HOW, EQUIPMENT AND MANPOWER FOR 35 YEARS

Salvage Defective Castings Using Epoxy Compounds

When possible, foundrymen salvage imperfect castings. This takes time and skilled labor.

Some castings are for decorative rather than mechanical use. For these, epoxy materials can do the job with less skilled workers.

■ Epoxy compounds come in handy around a foundry. They can save time and money in many phases of foundry work.

One such material, an epoxy resin compound containing powdered aluminum, helps Southern Casting Co., Sellersville, Tenn., speed its production of aluminum castings. The firm uses the material for salvaging defective castings, cementing gates to patterns, and for making modifications in the patterns themselves. Upon occasion, it's even been used to caulk metal air lines carrying 130 psi.

For Patching—Made by Smooth-On Mfg. Co., Jersey City, N. J., the metallic putty originally was tested by the user primarily as a patching material. After extensive use, the compound now shows up as an excellent material for repairing imperfect castings when they aren't for structural or mechanical uses.

Casting defects, such as miss-runs, raised cores and sand cracks, account for a disturbing number of rejects in any normal foundry run. Defects in castings serving a decorative or protective function can now be rectified with this compound. But its major asset isn't in the number of rejects saved from the melt pot. Other methods will do that, too.

Biggest Asset—Its big advantage is that practically anybody can apply the material and make an acceptable repair. It applies quickly and easily.

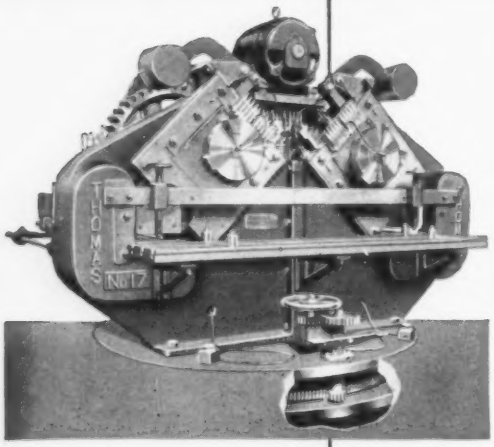
The epoxy compound comes in two-parts. The basic resin contains finely powdered aluminum. Then, there's the liquid curing agent. Each set consists of a bottle of curing agent and a can of compound.

Withstands Chemicals

Most chemicals won't harm a glass-reinforced polyester. Formulated by Haveg Industries, Inc., Wilmington, Del., the material is light, tough, and durable. It's used in making corrosion-proof tanks,

the trend is to THOMAS

double angle shears



The inbuilt quality and ruggedness of Thomas double angle shears insure years of trouble free service with a minimum of maintenance.

If you have a need for "high production" shearing of angles it will pay you to investigate Thomas.

Sizes are built for angles up to 8x8x1⅛", with or without turn-table.

WRITE FOR BULLETIN 310-A

Punches • Shears • Presses
Spacing Tables • Benders

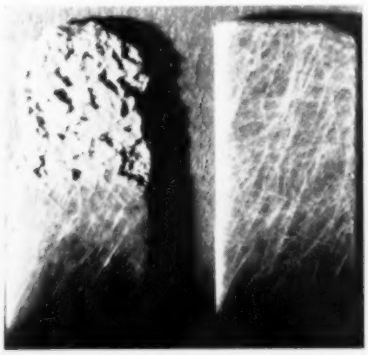
THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 113. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

towers and accessories, hoods, stacks, tubing, sheets, etc.

In a typical test, a sample of the material and a non-chemical resistant polyester are boiled in 10-pct sodium hydroxide for 48 hours. The non-chemical grade almost completely decomposes in its exposed area; the chemical-resistant grade, though, shows no change in appearance or properties.



After test, resistant polyester (right) shows no change.

Resists For Months—The chemical grade stands exposure to boiling alkali for several months before serious degradation begins.

This decomposition test is characteristic of the type failure which takes place in polyesters on exposure to all kinds of solutions containing water, says the tester. Sodium hydroxide merely accelerates the degradation.

Coats Cores, Molds

Job-tested, a powdered zircon core and mold coating is a working companion on jobs employing cold set binders. It has a fusion point of over 4000°F. The material's white color permits easy visual checking of coating thickness and ease in setting cores in molds. Frederick B. Stevens, Inc. of Detroit produces it.

Brightens Small Parts

A zinc brightener offers quality barrel plating of small parts at low cost. When added to a bath, it produces brilliant zinc deposits on

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* more quality

PRECISION, QUALITY AND COMPLETE FINISHING make possible the simplest and most economical application of Bunting Bearings. Bunting Cast Bronze Bearings and Bars and Bunting Sintered Powdered Oil-filled Bearings and Bars give you components that save time and expense in both production and maintenance operations. Bunting distribution of these stock products through leading, responsible distributors in all areas brings Bunting quality right to your door.

Your Bunting distributor is listed in the classified section of your telephone directory usually under Bars—Bronze, and Bearings—Bronze. Two modern Bunting factories and eleven Bunting Branch Warehouses expedite distribution in all areas. Write, or ask for catalogs giving complete dimensional listings and technical data.

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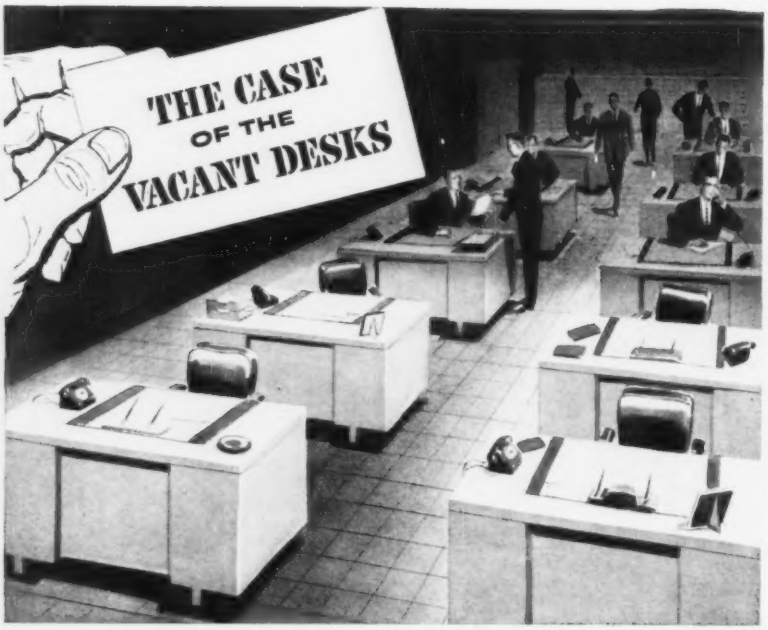
The Bunting Brass and Bronze Company • Toledo 1, Ohio • Branches in Principal Cities



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When a Foote Bros. Distributor has a customer or a prospect with a "tough" or unusual drive problem—one requiring the broad experience and knowledge of a power transmission specialist—he knows that a Foote Bros. Field Engineer will be available to help find the answer.

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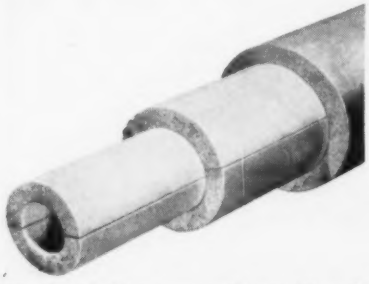
the entire surface of all the parts being plated, its maker says. Users save time and speed production because bright plating is done directly from the bath to eliminate subsequent bright dipping. Smoothex Corp., Cleveland, supplies the material.

Insulates to 1200°F

New pipe and block insulation withstands temperatures up to 1200F. Made by Ehret Magnesia Mfg. Co., Valley Forge, Pa., the material is a hydrous calcium silicate compound. This is blended



The insulation comes in sectional form for pipe to 18-in.

with other selected inorganic ingredients which are reinforced with long asbestos fibers.

It is a molded insulation and is chemically converted under controlled conditions to form a strong, hard, light, chemically stable material. It's nonflammable and unaffected by water or excessive water vapor.

Guards Polished Metal

Protective hide to guard polished metals now comes in five grades from Mystik Adhesive Products, Inc. of Chicago. In addition to a standard grade for aluminum, stainless, glass and sheet plastics, the line now includes black weather-resistant sheathing for architectural products; a fabricating grade, which can be drilled or cut; and a heavy-duty grade, which can also be used as sand-blast masking.

Pick exactly the right steel for any job from J & L's complete cold finished line

increased drill life 20% with J & L "1213" steel

This manufacturer of wrench socket blanks averaged 400 parts per hour when he changed to J & L "1213" steel. Form tool life increased from 10 to 20 hours. Drill life was 20% longer. J & L "1200" steels provide higher cutting speeds, longer tool life. Get facts from your distributor or write to Jones & Laughlin, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

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Jones & Laughlin

. . . a great name in steel

MACHINING PERFECTION always starts with the right steel

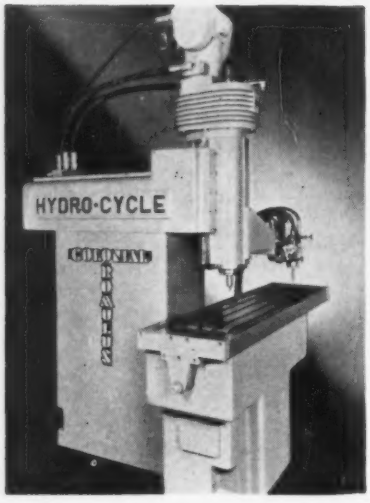
New Production Ideas

Equipment, Methods and Services

Gasoline Powered Trucks Lift To 20,000 lb.

Riding on pneumatic tires, a new line of lift trucks have 15,000 to 20,000-lb capacities. The gasoline powered handlers feature channel construction. This affords the operator high visibility. They offer the fastest possible cyclic rate of operation within the limits of safety, their maker says. Trucks come in 15,000, 16,500, 18,000 and 20,000-lb capacity models. Gasoline or LP-gas power them; they can have either straight, friction clutch transmission or fluid coupling transmission. The rugged units are recommended for operation over rough terrain. (Yale & Towne Mfg. Co.)

For more data circle No. 40 on postcard, p. 113



Contour Mills Apply to Small Shop, Big Plant

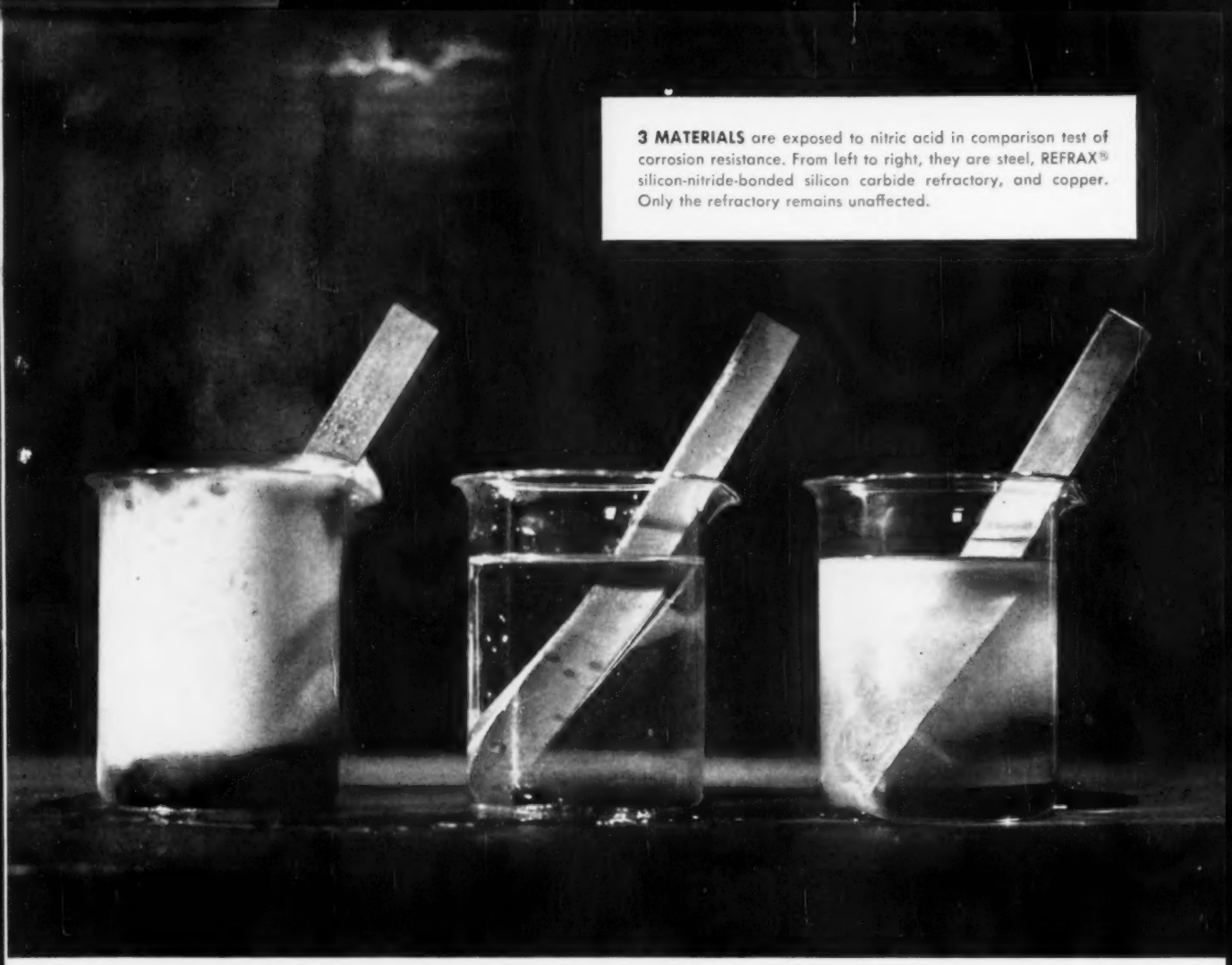
Previously only available as custom-built, contour mills now come in a complete line for general use. The units are hand-guided for handling jobs in large plants or small shops. They come either as complete machines or as a piece for "building block" erection. Both types mill many metals with accuracy. Applications range from small forming dies to aircraft components. Hand control of the tracer stylus attachment offers a true "feel" of the work. Thus, irregular contours are cut without complex equipment. In die work, the mill eliminates expensive "barbering" operations. Tracer and template are offset for operator convenience and safety. Micrometer adjustments accurately control the desired relationship between master and workpiece. Its tracer attachment can be furnished with single dimensional (depth), two-dimensional (360°) or three-dimensional control. The machine has an 18-in cross and 12-in. vertical travel. Spindle speeds are variable between 40 to 3000 rpm. (Colonial-Romulus Div., Colonial Broach & Machine Co.)

For more data circle No. 41 on postcard, p. 113

Hydraulic Dumper Lifts Loads to 60-in.

This hydraulic dumper elevates loads up to 750 lb for dumping heights in excess of 60 in. The setup combines ruggedness, stability and ease of operation with safety features, its maker says. It adapts to a wide range of applications. The dumper comes in portable or permanent models, is equipped with telescopic or straight mast. Additionally, it is equally efficient when powered by a 12-v automotive battery or plug-in electric motor. Overall length of the new unit is 54-in. Overall width is 42-in. The inside width of outriggers is 36-in. Overall height, with load raised, equals the dumping height plus 48-in. Overall height, with load lowered, equals the dumping height plus 12-in. Stainless steel chute and explosion or splash-proof power are available on order. In addition, the company makes dumpers for heights up to 60 in. (Uhrden, Inc.)

For more data circle No. 42 on postcard, p. 113



3 MATERIALS are exposed to nitric acid in comparison test of corrosion resistance. From left to right, they are steel, REFRAX® silicon-nitride-bonded silicon carbide refractory, and copper. Only the refractory remains unaffected.

Refractories for outstanding **corrosion resistance**

Wherever the possibility of chemical attack exists, it pays to consider refractories as materials of construction. The picture shows why. In numerous corrosive applications, CARBORUNDUM'S refractories are proving superior to other materials. They resist many highly basic substances as well as acids, acid slags and fluxes.

Typical applications are: linings in controlled atmosphere furnaces, pumps and pump parts handling molten aluminum, nozzles spraying corrosive *and* abrasive liquids, linings in muriatic acid furnaces, retorts for reducing and refining zinc ores, linings for glass tanks, etc.

But seldom is a refractory called upon to provide corrosion resistance alone. It may be required to transmit heat rapidly, resist thermal shock cracking, withstand abrasion, carry heavy loads, retain initial purity . . . whether at low or extremely high temperatures.

These properties are but a few of those found in super refractories pioneered by CARBORUNDUM. Among them, you are almost certain to find answers to your material selection problems. For help, fill in and mail this coupon today.

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Please send me:

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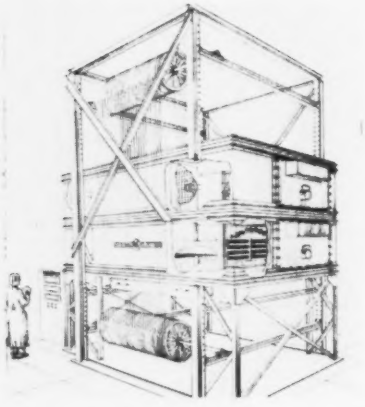
City _____ **Zone** _____ **State** _____

Hardness Testers Make Regular, Other Checks

Two motorized hardness testers make both regular and superficial tests. They come as standard models in 8 and 12-in. vertical capacity. Key asset of the unit is reduced operator fatigue; motorizing the main load affords this. These testers are also effective for laboratory work where only a few checks per hour are made. Here, elimination of the human element from application and removal of the major load offers a good standardization of test results. Load flexibility is another feature of these combination testers. Either of these machines makes tests on all Rockwell regular and superficial tests. The units are also available on special order in 4 and 16-in. vertical capacity, according to their manufacturer. (The Torsion Balance Co.)

For more data circle No. 43 on postcard, p. 113



Wire Enameling Oven Uses Gas or Electric Heat

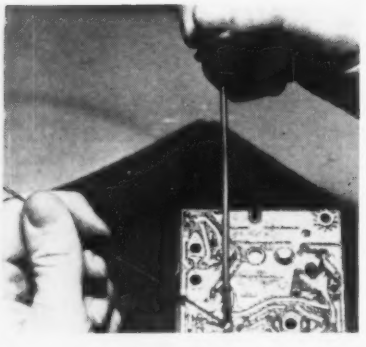
Capable of operating on fuel gas or electric heat, this universal enameling oven continuously bakes and cures film-type insulating coatings on wire. The oven bakes or dries these coats on metallic strip also. It adapts to a wide variety of coating applications. The interchange of heat inserts changes the oven heat pattern. Coating bake and cure thus adjusts to optimum values consistent with the physical and chemical characteristics of the coating material, its makers say. Since standard oven sections operate on fuel gas or electric heat, heat costs can be based on the most economical fuel in the user's locality. Once in service, the heat source can be changed from one type to another by changing heating plugs. The oven comes in six basic sizes. (General Electric Co.)

For more data circle No. 44 on postcard, p. 113

Air Gun Fires 5000 Staple Nails Into Packages

If you have packaging problems, this may be helpful. This narrow-crown pneumatic staple - nailer drives more than 5000 staple-nails with one loading. This cuts reloading time and keeps boxes of parts, etc. on the move. The unit drives a ⅛-in. crown staple having either a ⅜, 7/16, or ½-in. leg length, depending upon the cartridge used. Two models are available. One provides a light staple of 0.020 x 0.050-in. wire. The other uses heavy staples of 0.020 x 0.050-in. wire. Each staple-nail forms from an unbreakable, flexible belt of precut wire lengths coiled in a compact expendable plastic magazine. Staple-nails come in chisel, divergent and special point styles. (Singline Industrial Corp.)

For more data circle No. 45 on postcard, p. 113



Miniature Soldering Iron Joins Small Items

Weighing less than 1½ oz, this miniature soldering iron gets into narrow places on tiny work. Especially useful with miniaturized circuitry and the like, it handles production-line soldering of sub-miniature equipment with ease. The unit joins very small connections inside equipment with little heat loss and no damage to adjacent wiring, insulation and terminals. A tiny tubular heater, in the extreme top of the iron, develops a tip temperature of 750 to 850°F. This design provides rapid recovery under production conditions. The tip is vacuum processed iron, highly resistant to harmful effects of tin and high temperatures. (General Electric Co.)

For more data circle No. 46 on postcard, p. 113

Saves Time... Cuts Costs

Rotary Planer • • • do milling jobs in one-third to one-seventh of time on an Espen-Lucas Rotary Planer.

Big Sawing • • • production cutting of large stock —rapid, easy, straight-to-a-line piece after piece—on Espen-Lucas Cold Sawing Machines.

The **ESPEN-LUCAS** *Machine Works*

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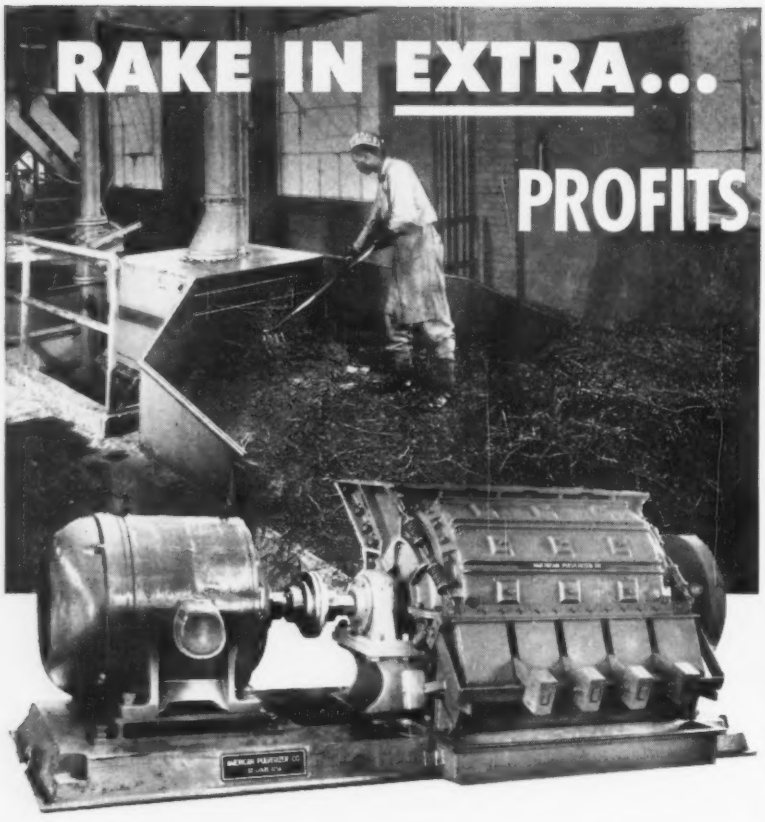
BUILDERS OF LARGE COLD SAWING MACHINES • ROTARY PLANERS • COLUMN FACERS • HEAVY TYPES OF SPECIAL MACHINERY



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American METAL TURNINGS **CRUSHER**

NOW PRODUCING SHOVELING CHIPS FOR SCORES OF AMERICA'S BLUE CHIP COMPANIES

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- *Up to 50 Gallons Cutting Oil Recovery Per Ton.*
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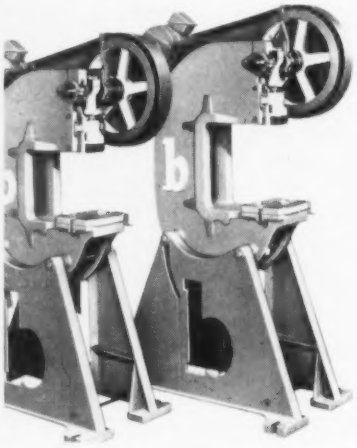
NEW EQUIPMENT

Deep throat presses

Three new deep throat presses rate at 10 ton capacities each. They come in three distinct shut heights (bed to slide, stroke down, adjustment up) measuring: 7¾, 10¾



and 13¾-in. Standard strokes are 1¼-in. Other strokes of 1½, 2, 2½ and 3 in. are available, with corresponding reduction in shut heights. A 5-in. opening exists between columns. (Benchmaster Mfg. Co.)

For more data circle No. 47 on postcard, p. 113

Control transformers

Small control transformers of the normal reactance type supply various low voltages for many types of applications. They handle 115,-230,460 or 575-v circuits. (Hindle Transformer Co., Inc.)

For more data circle No. 48 on postcard, p. 113

Creep Tester

Air operated, a combination stress-rupture and creep testing machine provides for all types of stress rupture and creep tests. Applied load indicates on a large dial at the top of the machine. The amount of elongation under a prevailing load can be plotted automatically on a built-in electronic recorder. This is an optional feature which eliminates guesswork and ocular measurements. Currently available

in 12,000 or 20,000-lb capacities, it is guaranteed to meet all ASTM and federal requirements for accuracy. Infinitely selectable loads can be applied and maintained for any desired period of time from minutes to years. Separate temperature controls enable the operator to select any furnace testing temperature up to the limit of the unit, 1800 or 2000°F. (Tinius Olsen Testing Machine Co.)

For more data circle No. 49 on postcard, p. 113

Divider Setter

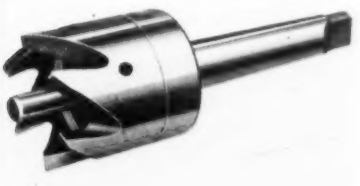
This precision divider setter helps layout men and others set dividers precisely. Its plated vernier scale

permits accurate settings to 0.001-in. The rule is hard chromium plated with a non-scratch surface. (Ait Transport Equipment, Inc.)

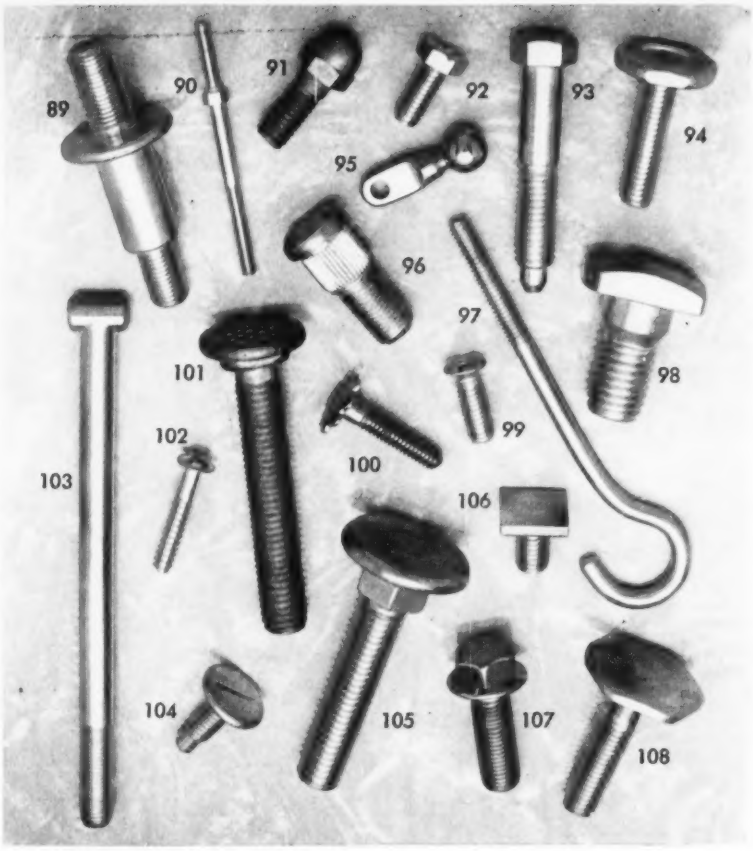
For more data circle No. 50 on postcard, p. 113

Hole-mill

Hole-making is the job of a new hole-mill. It's a high-production tool operating like a conventional hole saw. It produces deep holes in flat, thick plate, or on curved



cylindrical pieces; mills through-holes in stock as thick as ¾-in. in some tool sizes. It cuts fast, uses automatic feeds on various ma-



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If your "special" problem is production, delivery, OR design... call Buffalo Bolt. Over 100 years experience and reliable service.

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Many **GOOD** *products can be made* **BETTER** *...with* Ⓑ **SPECIAL FASTENERS**

PRESS THE TRIGGER—

and Chobert® Automatic Riveting saves time—cuts material costs!

Photograph —
North American Aviation, Inc.

North American Aviation Inc. use of Chobert system in blind application proves it!

Model "D"
Chobert Automatic Riveter.

An alert suggestion to replace stem and explosive type rivets with the Chobert Automatic Riveting System on a blind skin-to-frame joining operation saves North American Aviation 21.45 man minutes per unit. Poor uniformity with other rivets and time spent trimming and resetting are eliminated by using Chobert Blind Rivets—which cost, less too! A well known high-production riveting system in commercial fields, Chobert is recognized for outstanding results in the airframe industry.

Here's how the Chobert® Automatic Riveting System works!

The Chobert Blind Rivet has a tapered hollow shank through which a mandrel can be placed. This mandrel is loaded into a pneumatic riveting gun. The rivet, with the installed mandrel, is placed in the pre-drilled hole in the material. When the trigger on the pneumatic riveting gun is depressed, the mandrel is withdrawn through the rivet shank locking the rivet securely in place in the structure.

Let Chobert work and save for you now—get full details by writing for Chobert Automatic Riveting System brochure.

AVIATION DEVELOPMENTS INC. Chobert — Patented — Reg. U. S. Pat. Off.

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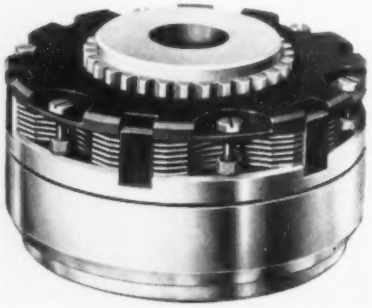
chines, goes completely through stock in one pass without clearing chips and can be used on alloy steels as well as low carbon. The unit can be resharpened as required. (Robert H. Clark Co.)

For more data circle No. 51 on postcard, p. 113

Magnetic Clutch

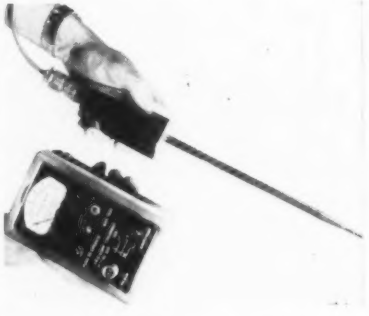
Machine tools and other equipment can use this magnetic clutch. It features comparatively short axial, and small radial dimensions. Complete isolation of the magnetic assembly from the integral mechanical parts, and compact, precision assembly of all component parts are other assets. It is furnished in stationary field or brush types and for either "wet" or "dry" operation (Fawick Airflex Div., Fawick Corp.)



For more data circle No. 52 on postcard, p. 113

Vibration Tester

This portable, self-powered vibration testing instrument enables companies to set up routine programs of seeking out vibration and establishing acceptable tolerances.



Its design and application have been simplified intentionally; thus, those inexperienced with vibration problems can use it after only minutes of instruction. The 24-oz weight makes it convenient for use in inaccessible places. It is calibrated directly in three ranges of 0.1, 1, and 10 mils full scale reading. (International Research & Development Corp.)

For more data circle No. 53 on postcard, p. 113

Long Bed Lathe

For machining tubing, shafting and other long work, a 16-in. x 14-ft lathe takes up to 129-in. between centers. Swing over cross slide is 9⅝-in. (11⅛-in. without chip guard). Maximum capacity over bed ways is 16¼-in. diam. A raised lathe comes with swing over bed increased to 25⅛-in. Continuous X-bracing the entire length of the bed provides extreme rigidity. Hardened bed ways are optional. (South Bend Lathe Works).

For more data circle No. 54 on postcard, p. 113

Steel Strapper

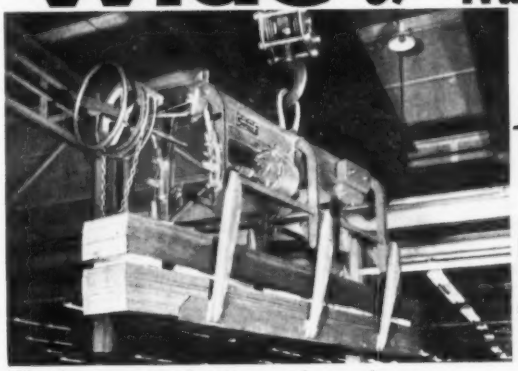
Automatic, a new round steel strapping machine meets the packaging and bundling problems created by automation. Requiring 11½-sq ft floor space, it ties packages from 2-in. high x 8-in. wide to 20-in. high x 26-in. wide. The standard machine ties packages up to 16-in. high and 22-in. wide. All functions are mechanically controlled and interlocked enabling a capacity of 24 ties per minute. The model uses from 14- to 18-gauge round steel strapping. (United States Steel Corp., Gerrard Steel Strapping Div.)

For more data circle No. 55 on postcard, p. 113

"Quick-dump" Valves

Three new "quick-dump" control valves offer fast, smooth operation of double-action cylinders. The new valves are four-way, five-port models. They have no internal springs, packings, pistons, or sliding metal-to-metal contacts. Valving action is fast, giving smooth flow, dead-

Wide or Narrow...

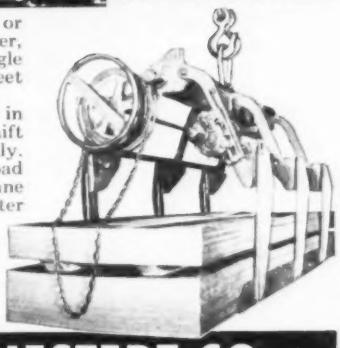


1 C•F LIFTER HANDLES THEM ALL

Whether your production requires a few or many widths of sheet steel, 1 C-F Lifter, with its wide range of jaw and carrying angle adjustments will probably meet all your sheet handling requirements.

Adjustments are made by the operator in a few seconds, permitting the Lifter to shift from wide to narrow sizes almost instantly.

Because it can pick up, carry and unload more loads per hour, using less man and crane time than any other method, a C-F Lifter will soon pay for itself.



Bulletin SL-25 gives you the complete story of C-F Lifter advantages to you. Ask for it today. There's no obligation.

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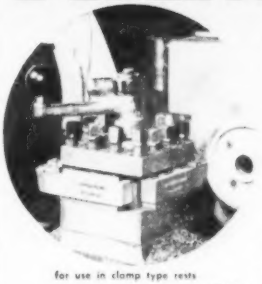
ARMSTRONG



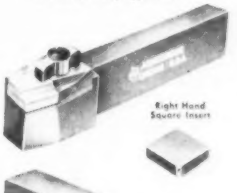
for use in clamp type rests

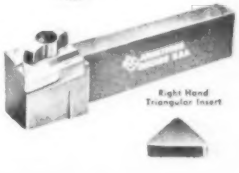
for use in conventional tool holders

Carbide Insert TOOL HOLDERS

ARMSTRONG Carbide Insert Tool Holders are of two types, (1) for use in conventional tool posts (2) for use with clamp rests. Right-hand and left-hand tools for holding either triangular or square Armide "throw-away" inserts. Each style in a full range of sizes.

Carried in stock by leading Industrial Distributors everywhere. These efficient, economical tools end all tool grinding, save tooling-up time and cut costs.



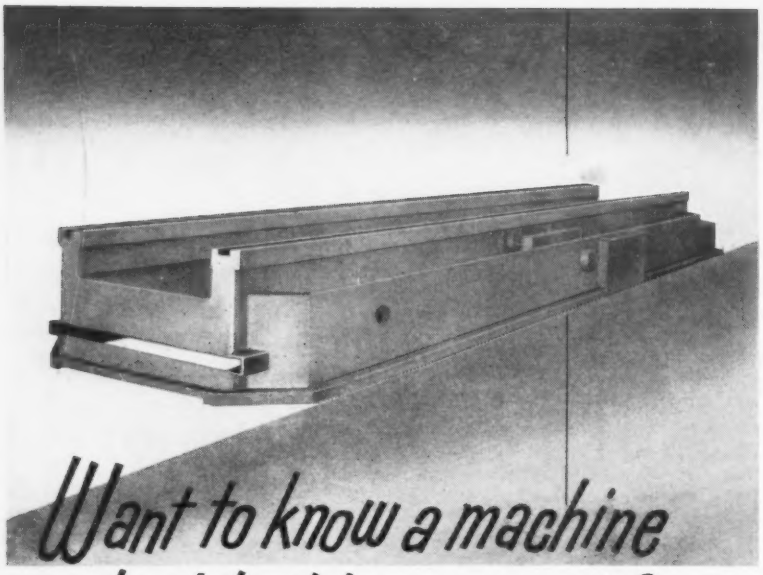


Write for Catalog Sheets

Buy ARMSTRONG TOOLS from your Industrial Distributor

ARMSTRONG BROS. TOOL CO.

5209 W. ARMSTRONG AVE. • CHICAGO 30, ILL.



Want to know a machine tool builder's secret?

Right now there's a famous-name milling machine on this 32-foot Acme base, but our customer isn't telling how Acme redesign made his machine stronger and lighter, cut his machining time and trouble to the bone, and saved him money! Naturally he's talking about results: higher production, faster delivery, easy incorporation of special design features.

Your machine, too, can be redesigned as a weldment to include the same cost reduction advantages . . . and produce the same results. Interested? Then have one of our engineers call . . . it won't cost you anything. Fact is, our redesign and quotation service is *free*, and prompt, whether you are now using weldments or castings.

Write to Acme Welding, 1044 New Britain Ave., West Hartford, Conn. and ask for your free copy.

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DIVISION of THE UNITED TOOL & DIE CO.

A.S.M.E. U68-U69 Qualified Welders • A.P.I.-A.S.M.E. Approved
Underwriters Label and Inspection Service • Navy Approved
National Board Approved • Hartford Steam Boiler Inspection Service

seal closing, with large capacity and long service life, the manufacturer says. Two of the valves operate electrically; the third has a hand lever. The electric valves do not employ solenoids. Instead, they have electro-magnetic armatures. (Humphrey Products Div., General Gas Light Co.)

For more data circle No. 56 on postcard, p. 113

Welding Helmets

A new helmet linkage provides a fast, easy method of attaching or detaching a welding helmet without removing the hard cap from the head. The safe welding helmet hard

cap combination provides head protection for the welder 100 pct of the time. It also permits perfect individual vertical adjustment of the welding plate retaining frame before the welder's eyes for his own comfort. (Kedman Co.)

For more data circle No. 57 on postcard, p. 113

Vibration Analysis

Two new lightweight model vibration analyzers provide portable instrumentation for machine tools and other equipment. They measure, troubleshoot and "balance out" vibrations caused by rotating parts and assemblies. One model primarily does "in place" and production balancing, while another incorporates features for analyzing or troubleshooting as well as bal-

ancing. At maximum sensitivity, both models have a full-scale displacement range of 0.001 in. Both units operate on 110-v 50/60-cycle, 1-phase alternating current. One, however uses 40 watts, while the other requires 50 watts. (International Research & Development Corp.)

For more data circle No. 58 on postcard, p. 113

Scriber

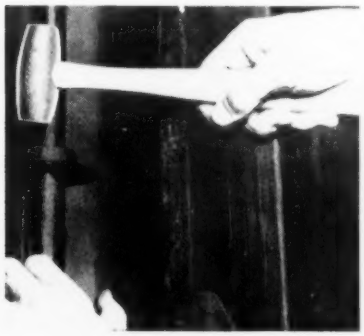
With a newly developed point, a stylus easily inscribes a permanent marking on most any kind of surface. Shaped and used like an

ordinary pen, the point has cutting edges that cover the base and side in a radial pattern. This produces a flowing type mark of metals. (Arch Crown Tags, Inc.)

For more data circle No. 59 on postcard, p. 113

Tapping Hammers

Tapping hammers come from maker, in either brass, bronze, beryllium or copper. The metal



non-sparking hammers are available with head sizes ½ through 5 lb. (Hunter Tool Co.)

For more data circle No. 60 on postcard, p. 113

ALL-HYDRAULIC !
SILENT HOIST
KRANE KAR
HYDRAULIC
Boom Swinging
Boom Topping
Boom Telescoping
Load Hoisting
Originator and leader in its class for 30 years, KRANE KAR goes ALL-HYDRAULIC. Affords amazing ease of handling... touch control of all crane operations . . . with other engineering advances that simplify operator's work . . . eliminating gear shifting and clutch replacements . . . cutting maintenance to the bone and setting new standards of efficiency and productivity. Get the details. Write, wire, telephone today.
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Hendrick Manufacturing Company, pioneer perforator, can really help designers improve product appearance and saleability SOLD! No matter what the material you're using... be it metal, masonite, rubber, plastic, or insulated board, Hendrick's wide experience and manufacturing facilities can be of real help You can select from hundreds of attractive designs in commercially rolled metals and gauges in round, square, diamond, hexagonal, or slotted, squarround, perforation in plain or Panel effects.
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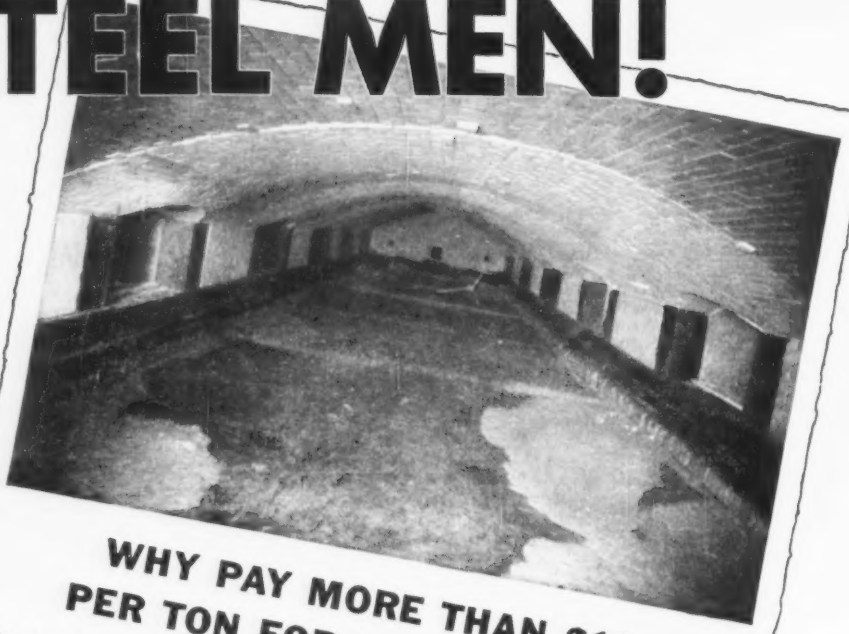
STEEL MEN!



WHY PAY MORE THAN $12 PER TON FOR FLUX BLOCKS?

ORIGINALLY, glass tanks were built of small, fire-clay brick or sandstone blocks. No. 1 fire-brick of this type can be bought for $12 per ton. Clay flux blocks of essentially the same materials cost $60 per ton. Why pay a 500% premium simply to get *bigger pieces* of the same material?

Your reply, of course, is that the larger pieces improve furnace life by 40% to 50%—that you are willing to pay 500% more for your blocks, to get 50% greater life for your tanks. And that is true of every glass-tank owner in America today. Since you are already paying a 500% premium for a 50% return, *why is it not logical for you to buy Corhart Electrocast, at a smaller price premium over clay,* AND GET OVER 200% INCREASE IN FURNACE LIFE?

If you are looking for economy in the purchase of your tank blocks, you need pay only $12 per ton. On the other hand, if you want the lowest cost per day of tank life, or the lowest cost per ton of glass produced, you can not stop at the $12 block *or at the* $60 *block.*

Corhart Electrocast is the world's highest-priced refractory per ton of blocks, and the lowest-cost refractory per ton of glass produced . . . May we *prove* it to you? Write for definite facts. *Address:* Corhart Refractories Co., *Incorporated,* 16th and Lee Sts., Louisville, Ky.

CORHART ELECTROCAST REFRACTORIES

IN June, 1933, when this old ad appeared, Corhart Electrocast was still new in the glass industry. Only a few glass companies dared then to buy it, "one of the world's highest-priced refractories". But today its use is practically universal . . .

Now Corhart 104 is still new in the steel industry — but despite its high price, it offers steel furnace operators the same opportunities for greater production and lower costs that Corhart Electrocast brought to glass.

May we send you complete data? Address: Corhart Refractories Co., Incorporated, 1610 West Lee Street, Louisville, Kentucky, U.S.A., SPring 8-4471.

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CORHART 104 ELECTROCAST REFRACTORY

The words "Corhart" and "Electrocast" are registered Trade Marks which indicate manufacture by Corhart Refractories Company, *Incorporated.* Corhart Refractories Co., *Incorporated,* 1600 West Lee Street, Louisville 10, Kentucky, U.S.A.—Telephone SPring 8-4471.

The Iron Age Summary

Mill Order Backlogs Are Falling

Mills are catching up on their order backlogs, reflecting easier market conditions.

Users are becoming more choosy about quality, and mill rejection rate is on the rise.

■ Easier market conditions are cutting into steel order backlogs. The situation varies from mill-to-mill, but overall the trend in order backlogs is down. This trend is likely to continue at least through the second quarter.

A pickup in automotive steel ordering could reverse the mills' backlogs position overnight. But no one seriously looks for Detroit to come to life until late in the second quarter or early in the third.

Rejections Rise—Steel users apparently are content to live off their inventories as long as they can. They're counting on the mills to pull their chestnuts out of the fire in case they need quick delivery. The mills don't like the idea, but competition is forcing some of them to play warehouse for important customers.

The mills also are taking it on the chin from another direction. Customers are more choosy about quality. Rejection rate for quality reasons is on the rise. This usually happens when supply of any steel product exceeds demand.

Ingot Rate Drops—Meanwhile, indications are that the gradual decline in the steel operating rate will continue at least through second quarter. The mills are using the breather to schedule production and rolling schedules on a more efficient basis. Maintenance and repair also are coming in for more attention.

Some mills, too, apparently are building inventories of ingots and semi-finished steel. This strategy would put them into a position to make a quick turnabout should market demand pick up suddenly. But it would also mean that the operating rates of these mills are likely to drop sharply when inventories get to where they want them.

Overall Outlook—But despite the current easiness in some products, the steel outlook for the year is considered good. There's been no letup in demand for heavy plates, structurals, and pipe for the oil and gas industries.

Construction, shipbuilding, freight cars, capital equipment and petroleum will be the mainstays of the market until automotive catches its expected second wind in third and fourth quarters. Appliances also are showing signs of strength. And the emphasis on inventory reduction should diminish toward end of the year.

THE IRON AGE steel scrap price composite rose this week on the basis of strength in the East. In other centers, broker buying and industrial list prices indicated a reversal of the downtrend.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,304	2,278	2,368	2,412
Ingot Index				
(1947-1949=100)	143.4	141.8	147.4	150.2
Operating Rates				
Chicago	86.0	86.0	86.0	98.0
Pittsburgh	94.0	93.0	95.0	100.0
Philadelphia	103.0	104.5	105.0	104.5
Valley	83.0	90.0*	82.0	99.0
West	103.5	101.5*	100.0	106.0
Buffalo	95.0	97.5	93.0	105.0
Cleveland	83.0	86.0*	92.0	101.5
Detroit	90.0	97.0	99.0	98.0
S. Ohio River	62.0	59.5*	66.0	89.4
South	95.0	95.5	97.0	23.5
Upper Ohio R.	92.0	95.0*	89.0	106.0
St. Louis	90.0	93.0	101.0	94.0
Northeast	64.0	64.0	66.0	90.0
Aggregate	90.0	89.0	92.5	98.0

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.670	5.670	5.670	5.179
Pig Iron (Gross Ton)	$64.56	$64.56	$64.56	$60.29
Scrap, No. 1 hvy (Gross ton)	$42.83	$42.17	$44.17	$55.00
Nonferrous				
Aluminum ingot	27.10	27.10	27.10	25.90
Copper, Electrolytic	32.00	32.00	32.00	46.00
Lead, St. Louis	15.80	15.80	15.80	15.80
Magnesium ingot	36.00	36.00	36.00	34.50
Nickel, electrolytic	74.00	74.00	74.00	64.50
Tin, Straits, N. Y.	99.25	99.625	98.875	98.375
Zinc, E. St. Louis	13.50	13.50	13.50	13.50

*Revised

Flat-rolled Pickup In 3rd Quarter?

Some flat-rolled producers see it happening if the automakers get off to rapid start on '58 models.

Meanwhile, buyers have upper hand in placing orders for the majority of products.

▪ Banking on the prospect of a fast start in 1958 auto production, flat-rolled mills are looking for an order pickup in the early fall.

They reason this way: Steel buying for the '57 models should be over by the end of July. Then, if the carmakers plan to introduce the '58 models in October, as rumored, they will have to order September tonnages for delivery in late August or early September.

The same long-range optimism is extended to bars, with the belief they may pick up even earlier, as the automotive suppliers swing into action.

These are comforting thoughts with the current market dragging its feet except for plate, structurals, and most grades of pipe. The signs of a buyer's market — shortened lead time, insistence on rapid delivery, and a rise in rejects for quality reasons—are more evident.

Sheet and Strip—There's still second quarter sheet tonnage available at many mills as they open up third quarter books. Light plate, for which demand is holding up, is keeping many continuous mills rolling full time. Another current trend is to stock hot-rolled sheet and strip bands so orders for cold-rolled and further processed sheet and strip can be quickly filled. It also helps in giving customers fast delivery on hot-rolled products.

At **Cleveland,** sheet mills are rolling light sheet about 50 pct of the time and continuous mill plate the rest. This is despite the fact one automaker doubled June sheet orders over May's and another also stepped up tonnage requests. Price-conscious warehouses there are now buying mill waste-waster sheet (third grade product) for sale to consumers.

May and June sheet tonnage still is searching for a home in the **Philadelphia** area and some light plate rolling continues.

Chicago mills, too, have second quarter cold-rolled sheet available. However, some hot-rolled sheet mills have order carryovers into the third quarter, due to light plate bookings. A few mills are booked through the second quarter on hot-rolled sheet. Warehouses are not increasing sheet purchases and some smaller ones are again reducing inventories.

Salesmen on the **West Coast** are pushing hard to get rid of big cold-rolled and galvanized sheet inventories. On the other hand, hot-rolled sheets are still moving easily.

Bar—Order slackness, present in varying intensity in all but Western markets, leads to short but varied delivery times. In some cases cold-finished bars can be obtained faster than hot-rolled.

Delivery on cold-finished varies from one to four weeks at **Chicago.**

At **Detroit** bars are slow. However, a pickup is expected in June if ordering for the new car models begins then.

Hot-rolled bar market is holding up surprisingly well at **Cleveland.**

Hot-rolled deliveries at **Philadelphia** are from 3 to 6 weeks. The lower figure is possible if customers can catch a rolling for the product they want.

West Coast mills are now promising 30- to 60-day delivery—the fastest in over a year.

Plates and Shapes—Light plate, in general, is sold out through the end of this quarter. Heavier plate and structurals are still on allocation.

At **Chicago** light structurals can be obtained in 6-8 weeks. However, heavy structurals are still coming in from outside that area and local customers continue on quotas. Foreign supplied angles and shapes can be had on about 12 weeks delivery. Allocations of foreign plate to brokers are being reduced.

There are a few more standard and bar size angles available in the **Philadelphia** market, but otherwise things are as tight as ever.

Light plate is described as a drug on the market at **Detroit.** One part-time producer is quoting four weeks delivery. Rest of the plate and structural market is strong with no letup in sight.

Structurals shipped from the East are helping **West Coast** users continue jobs, but basically it's a tight market.

Other Products—An upsurge in merchant wire ordering is expected next month for June orders by distributors anxious to beat expected price increases. Pig iron market continues relatively strong with foundry business "spotty," some active, others on 3- and 4-day weeks. The buttweld pipe slackness is hitting the **West Coast,** and foreign imports aren't helping the situation.

PURCHASING AGENT'S CHECKLIST

Streamlining paperwork can trim production workload. **P. 51**

Look for a pickup in steel in second half of '57. **P. 54**

Kaiser plans two-piece aluminum food cans. **P. 62**

COMPARISON OF PRICES

(Effective April 30, 1957)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type: declines appear in *Italics*.

	Apr. 30 1957	Apr. 23 1957	Apr. 2 1957	May 1 1956
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.675¢	4.675¢	4.675¢	4.325¢
Cold-rolled sheets	5.75	5.75	5.75	5.325
Galvanized sheets (10 ga.)	6.30	6.30	6.30	5.85
Hot-rolled strip	4.675	4.675	4.675	4.325
Cold-rolled strip	6.870	6.870	6.870	6.28
Plate	4.87	4.87	4.87	4.52
Plates, wrought iron	10.40	10.40	10.40	10.40
Stainl's C-R strip (No. 302)	50.00	50.00	50.00	44.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$16.30	$9.95	$9.95	$9.85
Tin plates, electro (0.50 lb.)	9.00	8.65	8.65	8.55
Special coated mfg. ternes	9.55	9.20	9.20	9.10
Bars and Shapes: (per pound)				
Merchant bars	5.075¢	5.075¢	5.075¢	4.65¢
Cold finished bars	6.85	6.85	6.85	5.90
Alloy bars	6.125	6.125	6.125	5.65
Structural shapes	5.00	5.00	5.00	4.60
Stainless bars (No. 302)	43.25	43.25	43.25	38.25
Wrought iron bars	11.50	11.50	11.50	11.50
Wire: (per pound)				
Bright wire	7.20¢	7.20¢	7.20¢	6.60¢
Rails: (per 100 lb.)				
Heavy rails	$5.275	$5.275	$5.275	$4.725
Light rails	6.25	6.25	6.25	5.65
Semifinished Steel: (per net ton)				
Rerolling billets	$74.00	$74.00	$74.00	$68.50
Slabs, rerolling	74.00	74.00	74.00	68.50
Forging billets	91.50	91.50	91.50	84.50
Alloy blooms, billets, slabs	107.00	107.00	107.00	96.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.80¢	5.80¢	5.80¢	5.025¢
Skelp	4.625	4.625	4.625*	4.225
Finished Steel Composite: (per pound)				
Base price	5.670¢	5.670¢	5.670¢	5.179¢

	Apr. 30 1957	Apr. 23 1957	Apr. 2 1957	May 1 1956
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$68.88	$68.88	$68.88	$65.26
Foundry, Valley	65.00	65.00	65.00	60.50
Foundry, Southern Cin'ti	67.17	67.17	67.17	62.93
Foundry, Birmingham	59.00	59.00	59.00	55.00
Foundry, Chicago	65.00	65.00	65.00	60.50
Basic, del'd Philadelphia	68.38	68.38	68.38	64.48
Basic, Valley furnace	64.50	64.50	64.50	60.00
Malleable, Chicago	65.00	65.00	65.00	60.50
Malleable, Valley	65.00	65.00	65.00	60.50
Ferromanganese, cents per lb‡ 74 to 76 pct Mn base.	12.75¢	12.75¢	12.75¢	9.50¢
Pig Iron Composite: (per gross ton)				
Pig iron	$64.56	$64.56	$64.56	$60.29
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$42.50	$42.50	$42.50	$54.50
No. 1 steel, Phila. area	47.50	45.50	49.50	56.50
No. 1 steel, Chicago	38.50	38.50	40.50	54.50
No. 1 bundles, Detroit	34.50	34.50	34.50	51.50
Low phos., Youngstown	44.50	42.50	41.50	61.50
No. 1 mach'y cast, Pittsburgh	51.50	49.50	49.50	58.50
No. 1 mach'y cast, Philadel'a	55.50	55.50	55.50	55.50
No. 1 mach'y cast, Chicago	45.00	44.50	45.50	56.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$42.83	$42.17	$44.17	$55.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$14.50
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$17.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	32.00	32.00	32.00	46.00
Copper, Lake, Conn.	32.00	32.00	32.00	46.00
Tin, Straits, New York	99.25†	99.625	98.875	98.375
Zinc, East St. Louis	13.50	13.50	13.50	13.50
Lead, St. Louis	15.80	15.80	15.80	16
Aluminum, virgin ingot	27.10	27.10	27.10	25.00
Nickel, electrolytic	74.00	74.00	74.00	84.50
Magnesium, ingot	36.00	36.00	36.00	34.50
Antimony, Laredo, Tex.	33.00	33.00	33.00	34.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	66.50	67.00	67.50	68.00	.....
Birmingham *R3*	58.50	59.00*	.....	.....	.....
Birmingham *W9*	58.50	59.00*	63.00	.....	.....
Birmingham *U4*	58.50	59.00*	63.00	.....	.....
Buffalo *R3*	64.50	65.00	65.50	66.00	.....
Buffalo *H1*	64.50	65.00	65.50	66.00	.....
Buffalo *W6*	64.50	65.00	65.50	66.00	.....
Chester *P2*	64.50	67.00	67.50	.....	.....
Chicago *I4*	64.50	65.00	65.00	65.50	.....
Cleveland *A5*	64.50	65.00	65.00	65.50	69.50†
Cleveland *R3*	64.50	65.00	65.00	65.50	.....
Duluth *I4*	64.50	65.00	65.00	65.50	69.50†
Erie *I4*	64.50	65.00	65.00	65.50	69.50†
Everett *M6*	66.00	66.50	67.00	.....	.....
Fontana *K1*	72.50	73.00	.....	.....	.....
Geneva, Utah *C7*	64.50	65.00	.....	.....	.....
Granite City *G2*	66.40	66.90	67.40	.....	.....
Hubbard *Y1*	.....	.....	65.00	.....	.....
Ironton, Utah *C7*	64.50	65.00	.....	.....	.....
Midland *C11*	64.50	.....	.....	.....	.....
Minnequa *C6*	66.50	67.00	67.50	68.00	.....
Monessen *P6*	64.50	.....	.....	.....	.....
Neville Is. *P4*	64.50	65.00	65.00	65.50	69.50†
N. Tonawanda *T1*	.....	65.00	65.50	66.00	.....
Sharpsville *S3*	64.50	65.00	65.00	65.50	.....
So. Chicago *R3*	64.50	65.00	65.00	.....	.....
Swedeland *A2*	66.50	67.00	67.50	68.00	.....
Toledo *I4*	64.50	65.00	65.00	65.50	.....
Troy, N. Y. *R3*	66.50	67.00	67.50	68.00	72.50
Youngstown *Y1*	.....	.....	65.00	65.50	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. * Add $1.00 for 0.31-0.69 pct phos. † Intermediate low phos. ‡ Add $1.00 for 0.31 to 0.50 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $78.50; Jackson, *J1*, *I4* (Globe Div.), $77.25; Niagara Falls (15.01 15.50), $101.00; Keokuk (14.01 14.50), $103.50; (15.51 16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery 6 pct to 14 pct.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

←To identify producers, see Key on P. 152→

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	21.25	22.75	22.25	24.25	—	26.00	38.25	31.00	35.50	—	16.00	27.75	18.25
Slabs, billets	26.00	29.00	27.00	30.25	30.75	32.00	47.50	38.50	44.75	—	20.75	—	21.00
Billets, forging	—	35.00	35.75	36.50	39.50	39.00	59.75	45.25	53.50	30.75	27.25	27.75	27.75
Bars, struct.	40.50	41.25	42.50	43.25	46.25	46.00	70.25	53.25	62.25	36.25	32.50	33.00	33.00
Plates	42.50	43.25	44.50	45.50	48.00	48.75	73.75	57.50	67.00	38.75	33.75	35.50	34.50
Sheets	46.75	47.25	49.25	50.00	—	53.25	78.25	63.00	76.25	46.50	38.75	46.50	39.25
Strip, hot-rolled	34.50	37.50	35.75	39.00	—	42.50	66.50	51.50	61.00	—	29.75	—	30.75
Strip, cold-rolled	43.25	47.25	45.75	50.00	—	53.25	78.25	63.00	76.25	46.50	38.75	46.50	39.25
Wire CF; Rod HR	—	39.25	40.25-40.50	41.00-41.25	44.00	43.75	66.75-67.00	50.50-51.00	59.25-59.50	34.50	31.00	31.50	31.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J3*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Philadelphia, *D5*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Harrison, N. J., *D5*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1*; New Bedford, Mass. (.25¢ per lb higher), *R6*; Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*; Ft. Wayne, *I4*; Philadelphia, *D5*; Detroit, *R5*; Gary, *U1*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Philadelphia, *D5*; Vandergrift, Pa., *U1*; Gary, *U1*

Forgings billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*.

Broker Buying Halts Downward Trend

After three months of steady decline, the downward trend may be at a halt.

Broker activity gives trade an optimistic feeling. Philadelphia leads in rebounding.

▪ Higher broker buying prices and steady to higher industrial list prices have put a floor in the scrap market.

Bolstering the increased broker activity on the East Coast is a stronger export market. This combination raised the price in Philadelphia $2 for No. 1 grades.

As a result, THE IRON AGE Scrap Composite reversed its three months trend of almost uninterrupted decline, rising from $42.17 to $42.83. In other markets where token purchases and broker feelers were not sufficient to warrant increased prices, the trade was still optimistic.

Automotive lists went for $1 higher in Detroit than a month ago. However, this did not result in immediate increases in dealer prices. Some mills indicate they will rely on industrial tonnage and show little interest in buying dealer scrap.

On the West Coast, which had boasted highest prices in the nation, a $3 drop hit the market, which was none too steady even after the decline.

Pittsburgh — Prices of openhearth grades are unchanged here. The market continues to show signs of strength, but activity is too light to provide a basis for price changes. A mill on the fringe of the district bought scrap at prices equal to $1 over the last purchase by a local consumer. Turnings are up $2 on a mill order. Local factory bundles went for $48.30, or more than $2 over last month's price. Low phos is up $1 on a mill purchase.

Chicago—While the market continues relatively dull, broker buying prices are inching up. Bids for industrial scrap, bundles particularly, were moving above current consumer delivered prices. Anticipation of offers to buy industrial heavy melting by a large consumer at reduced prices failed to halt growing optimism at dealer and broker levels. Foundry grades seem particularly strong. Low phos 3 ft and under was incorrectly listed in April 25 issue. Correct price should have been $45.00 to $46.00.

Philadelphia — Price of openhearth grades jumped $2 on basis of a broker activity and pressure from the export market. No. 2 bundles followed with a $1 increase as did machine shop turnings. Cast grades are still showing weakness. Cupola cast dropped $3.

New York—Prices here are unchanged. Flourishing exports and expectations of domestic sales at higher prices within a few days are giving a healthier tone to this market. New orders are expected to carry a price $2 higher than current quotations.

Detroit—The market appears to have firmed here. Bidding on May automotive lists was up on an average of $1 from last month. There is no new activity in the dealer market and indications are that the majority of industrial tonnages will be moving outside the area.

Cleveland—The Valley market showed some signs of life in electric furnace grades and industrial lists. One small list went for $46.50 and some electric grades were showing strength. Mills are depending more on industrial lists than dealer stocks and are not interested in closing deals for small yard tonnage.

St. Louis—The market remains generally steady, with receipts continuing to slow down as a result of lower prices prevailing. Some of the railroad offerings have been going to other markets.

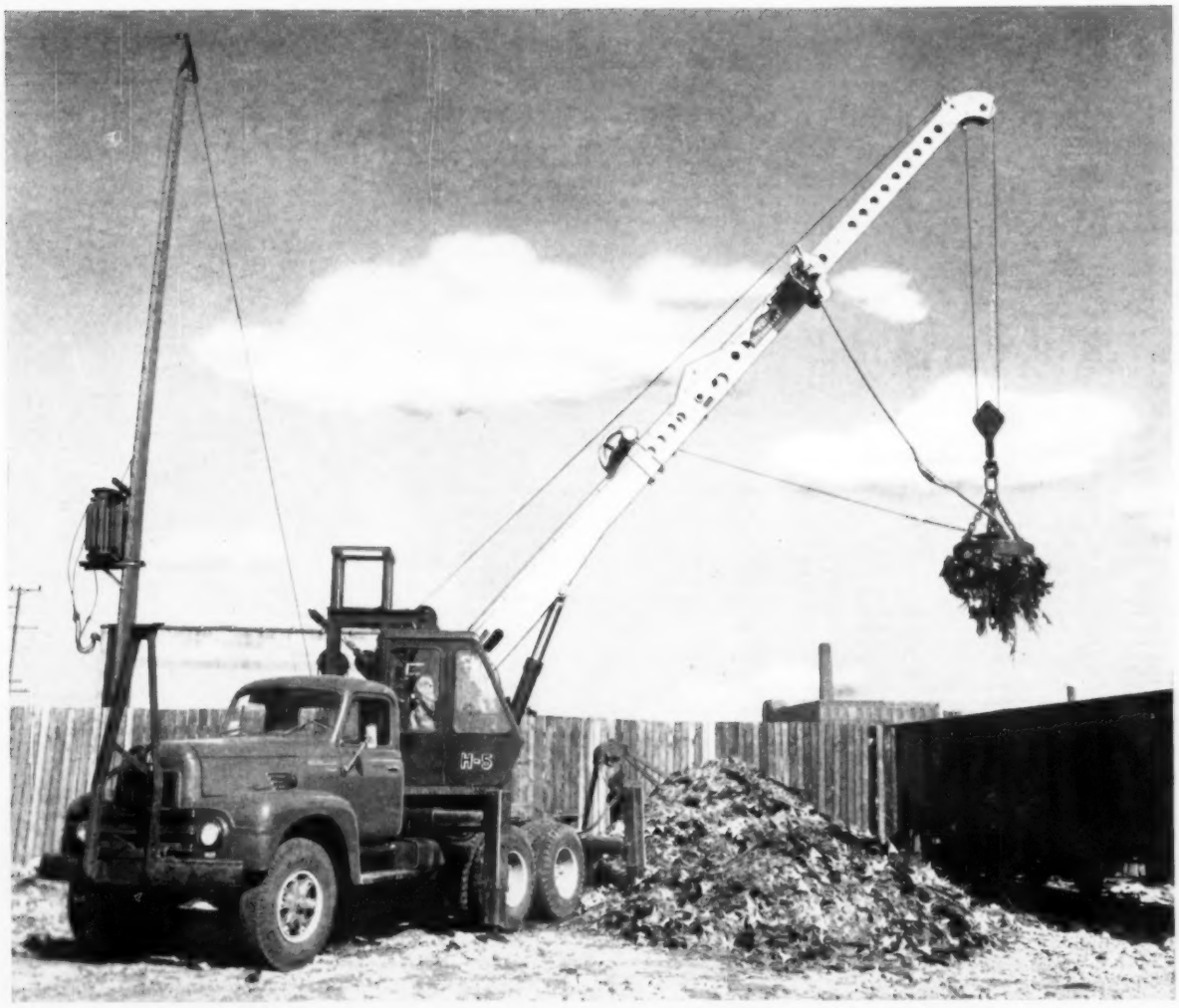
Birmingham—After a long absence, one of the large openhearth consumers returned to the market for a small tonnages. Most brokers are able to buy small tonnages against this order, but there is considerable resistance to prices offered. Export prices dropped $2 to $3 for May shipment. The grade "electric furnace, three ft and under" has been added to scrap price quotations. "Mashed tin cans" has been dropped.

Cincinnati—The market showed some psychological strength as an area mill announced $1 to $2 higher prices for May. But tonnage was only token. Cast grades showed a delayed decline.

Buffalo — Prices remain unchanged in an inactive market. Very little scrap is arriving at local yards. First scrap shipment into Buffalo via the Great Lakes has arrived.

Boston—The market is relatively static, indicating there may be a leveling off. Consumers are buying a little, bit with no real improvement in ordering.

West Coast — Most grades dropped $3 per ton in San Francisco and Los Angeles. And they appear to be soft at these new low levels. Mills are sitting pat with inventories in good shape.



Hydrocrane's Working Boom Hoist Speeds Scrap Metal Handling

With the Hydrocrane, *any* boom angle is a working position because the boom is raised or lowered dozens of times a day as part of the crane's regular operating cycle. Even with full load suspended you can raise or lower the boom, *and* swing or telescope *at the same time*, with the precise control that only the Hydrocrane offers. It's just one of the many unique time-saving features that make the Hydrocrane ideal for scrap handling.

You also gain many advantages working in confined areas. The Hydrocrane's working boom hoist, together with the line hoist, makes it easy to lift loads over stockpiled materials or under wires, miss columns as it swings to truck, or stockpile. The Hydrocrane's rugged outriggers, which permit conventional motor truck mounting, give you the unusual combination of high capacity and top mobility. Extremely short tail swing (about 4½ feet) lets you put the crane in the tightest spots.

Hydrocrane maneuverability and multi-job versatility make this crane a money-saving investment in any scrap yard. Hydrocrane travel speed and low-cost operation coupled with the unique operating characteristics described above put this machine way out front for scrap recovery and salvage operations. Your Bucyrus-Erie distributor will be happy to demonstrate either the 10-ton H-5 or 5-ton H-3 at your convenience.

141H56

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

SCRAP PRICES *(Effective April 30, 1957)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	42.00 to 43.00
No. 1 factory bundles	49.00 to 50.00
No. 2 bundles	35.00 to 36.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	29.00 to 30.00
Mixed bor. and ms. turn.	29.00 to 30.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	33.00 to 34.00
Low phos. punch'gs plate	48.00 to 49.00
Heavy turnings	38.00 to 39.00
No. 1 RR. hvy. melting	47.00 to 48.00
Scrap rails, random lgth.	59.00 to 60.00
Rails 2 ft and under	66.00 to 67.00
RR. steel wheels	56.00 to 57.00
RR. spring steel	56.00 to 57.00
RR. couplers and knuckles	56.00 to 57.00
No. 1 machinery cast.	51.00 to 52.00
Cupola cast.	43.00 to 44.00
Heavy breakable cast.	41.00 to 42.00

Chicago

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	39.00 to 40.00
No. 1 factory bundles	44.00 to 45.00
No. 2 bundles	32.00 to 34.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. forge crops	51.00 to 52.00
Low phos. punch'gs plate	46.00 to 47.00
Low phos. 3 ft and under	45.00 to 46.00
No. 1 RR. hvy. melting	45.00 to 47.00
Scrap rails, random lgth.	52.00 to 53.00
Rerolling rails	55.00 to 56.00
Rails 2 ft and under	55.00 to 56.00
Locomotive tires cut	51.00 to 52.00
Cut bolsters & side frames	49.00 to 50.00
Angles and splice bars	54.00 to 55.00
RR. steel car axles	69.00 to 70.00
RR. couplers and knuckles	48.00 to 49.00
No. 1 machinery cast.	44.00 to 46.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	37.00 to 38.00
Cast iron brake shoe	38.00 to 39.00
Cast iron wheels	46.00 to 47.00
Malleable	53.00 to 54.00
Stove plate	38.00 to 39.00
Steel car wheels	50.00 to 51.00

Philadelphia Area

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	38.50 to 40.00
No. 1 dealer bundles	47.00 to 48.00
No. 2 bundles	37.00 to 38.00
No. 1 busheling	47.00 to 48.00
Machine shop turn.	32.00 to 33.00
Mixed bor. short turn.	34.00 to 35.00
Cast iron borings	33.00 to 34.00
Shoveling turnings	36.00 to 37.00
Clean cast chem. borings	39.00 to 40.00
Low phos. 5 ft and under	52.00 to 53.00
Low phos. 2 ft and under	53.00 to 54.00
Low phos. punch'gs	53.00 to 54.00
Elec. furnace bundles	49.00 to 50.00
Heavy turnings	41.00 to 42.00
RR. steel wheels	57.00 to 58.00
RR. spring steel	57.00 to 58.00
Rails 18 in. and under	65.00 to 66.00
Cupola cast.	40.00 to 41.00
Heavy breakable cast.	53.00 to 54.00
Cast iron car wheels	57.00 to 58.00
Malleable	61.00 to 62.00
Unstripped motor blocks	37.00 to 38.00
No. 1 machinery cast.	55.00 to 56.00

Cleveland

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	38.00 to 39.00
No. 1 factory bundles	44.50 to 45.50
No. 2 bundles	30.00 to 31.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	27.50 to 28.50
Shoveling turnings	27.50 to 28.50
Cast iron borings	27.50 to 28.50
Cut struct'r'l & plates, 2 ft & under	45.00 to 46.00
Drop forge flashings	38.00 to 39.00
Low phos. punch'gs, plate	39.00 to 40.00
Foundry steel, 2 ft & under	43.00 to 44.00
No. 1 RR. heavy melting	44.00 to 45.00
Rails 2 ft and under	66.00 to 67.00
Rails 18 in. and under	67.00 to 68.00
Railroad grate bars	32.00 to 33.00
Steel axle turnings	30.00 to 31.00
Railroad cast.	53.00 to 54.00
No. 1 machinery cast.	51.00 to 52.00
Stove plate	48.00 to 49.00
Malleable	54.00 to 55.00

Youngstown

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	33.00 to 34.00
Machine shop turn.	22.00 to 23.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. plate	44.00 to 45.00

Buffalo

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 busheling	41.00 to 42.00
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	26.00 to 27.00
Mixed bor. and turn.	27.00 to 28.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	27.00 to 28.00
Low phos. plate	44.00 to 45.00
Scrap rails, random lgth.	56.00 to 57.00
Rails 2 ft and under	60.00 to 61.00
RR. steel wheels	49.00 to 50.00
RR. spring steel	49.00 to 50.00
RR. couplers and knuckles	49.00 to 50.00
No. 1 machinery cast.	44.00 to 45.00
No. 1 cupola cast.	40.00 to 41.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	34.00 to 35.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	34.00 to 35.00
Drop forge flashings	34.00 to 35.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	23.00 to 24.00
Low phos. punch'gs, plate	34.00 to 35.00
No. 1 cupola cast.	46.00 to 47.00
Heavy breakable cast.	42.00 to 43.00
Stove plate	43.00 to 44.00
Automotive cast.	52.00 to 53.00

St. Louis

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	22.00 to 23.00
Cast iron borings	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
No. 1 RR. hvy. melting	45.00 to 46.00
Rails, random lengths	48.00 to 49.00
Rails 18 in. and under	58.00 to 59.00
Locomotive tires uncut	50.00 to 51.00
Angles and splice bars	54.00 to 55.00
Std. steel car axles	67.00 to 68.00
RR. specialties	47.00 to 48.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	35.00 to 36.00
Cast iron brake shoes	36.00 to 37.00
Stove plate	36.00 to 37.00
Cast iron car wheels	42.00 to 43.00
Rerolling rails	58.00 to 59.00
Unstripped motor blocks	35.00 to 36.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	35.00 to 36.00
Elec. furnace, 3 ft & under	38.00 to 39.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and short turn.	23.00 to 24.00
Shoveling turnings	24.00 to 25.00
Clean cast. chem. borings	28.00 to 29.00
No. 1 machinery cast.	42.00 to 43.00
Mixed cupola cast.	34.00 to 35.00
Heavy breakable cast.	42.00 to 43.00
Stove plate	32.00 to 33.00
Unstripped motor blocks	26.00 to 27.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	32.00 to 33.00
No. 2 dealer bundles	29.00 to 30.00
Machine shop turn.	23.00 to 24.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	26.00 to 27.00
Clean cast chem. borings	30.00 to 31.00
No. 1 machinery cast.	43.00 to 44.00
Mixed yard cast.	38.00 to 39.00
Charging box cast.	43.00 to 44.00
Heavy breakable cast.	43.00 to 44.00
Unstripped motor blocks	30.00 to 31.00

Birmingham

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	26.00 to 27.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	27.00 to 28.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	27.00 to 28.00
Electric furnace bundles	43.00 to 44.00
Elec. furnace, 3 ft & under	41.00 to 42.00
Bar crops and plate	45.00 to 46.00
Structural and plate, 2 ft	44.00 to 45.00
No. 1 RR. hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	48.00 to 49.00
Rails, 18 in. and under	54.00 to 55.00
Angles & splice bars	62.00 to 63.00
Rerolling rails	58.00 to 59.00
No. 1 cupola cast.	47.50 to 48.50
Stove plate	47.00 to 48.00
Charging box cast.	34.00 to 35.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	38.00 to 39.00

Cincinnati

Brokers buying prices per gross ton, on cars

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	30.00 to 31.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	23.00 to 24.00
Low phos. 18 in. & under	49.00 to 50.00
Rails, random lengths	54.00 to 55.00
Rails, 18 in. and under	64.00 to 65.00
No. 1 cupola cast.	43.00 to 44.00
Hvy. breakable cast.	40.00 to 41.00
Drop broken cast.	53.00 to 54.00

San Francisco

No. 1 hvy. melting	$48.00
No. 2 hvy. melting	43.00
No. 1 dealer bundles	47.00
No. 2 bundles	35.00
Machine shop turn.	32.00
Cast iron borings	32.00
No. 1 RR. hvy. melting	48.00
No. 1 cupola cast.	57.00

Los Angeles

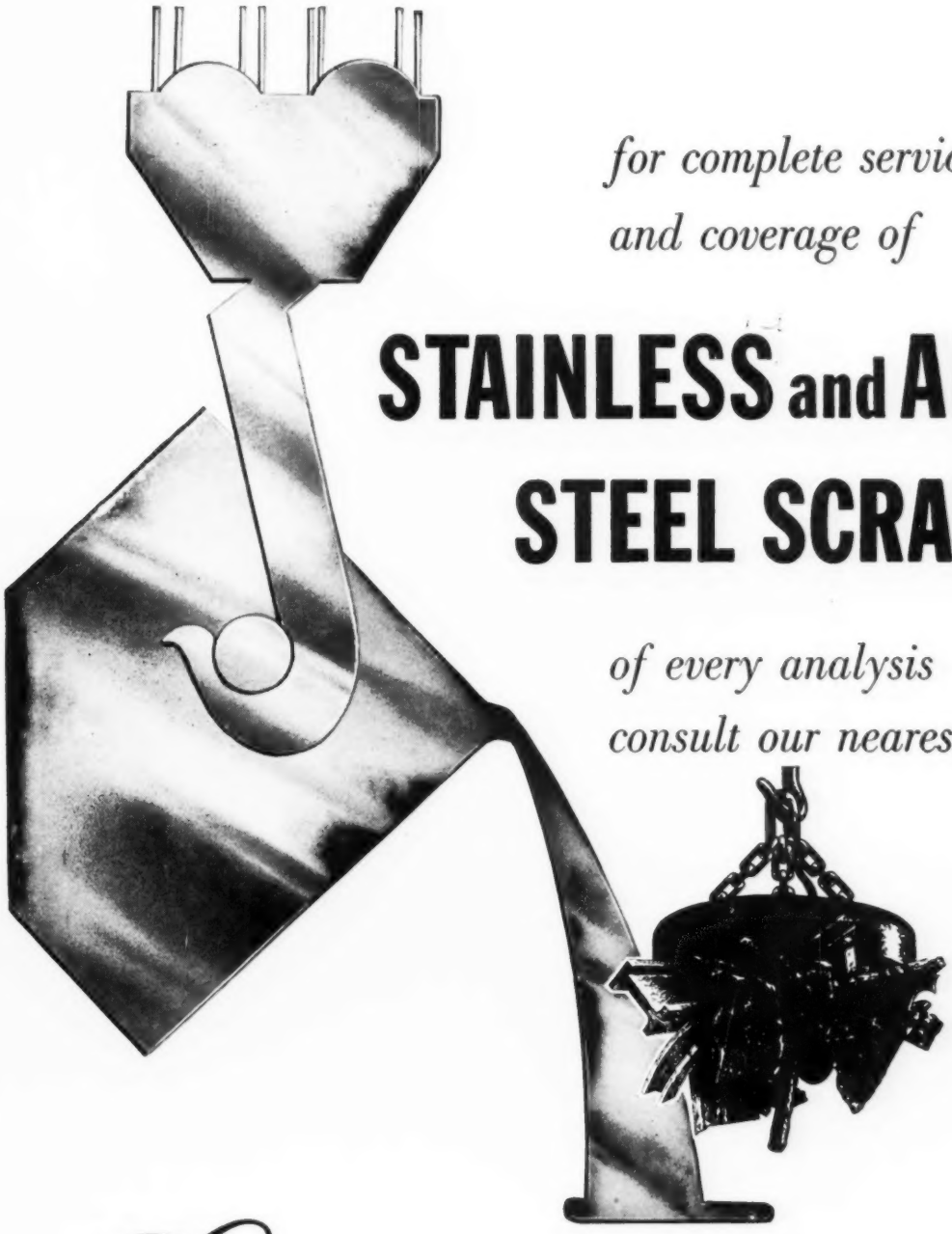
No. 1 hvy. melting	$48.00
No. 2 hvy. melting	43.00
No. 1 dealer bundles	47.00
No. 2 bundles	33.00
Machine shop turn.	32.00
Shoveling turnings	34.00
Cast iron borings	31.00
Elec. furn. 1 ft. and under (foundry)	60.00
No. 1 RR. hvy. melting	48.00
No. 1 cupola cast.	$53.00 to 54.00

Seattle

No. 1 hvy. melting	$48.00
No. 2 hvy. melting	42.00
No. 2 bundles	30.00
No. 1 cupola cast.	50.00
Mixed yard cast.	50.00

Hamilton Ont.

No. 1 hvy. melting	$43.00
No. 2 hvy. melting	38.00
No. 1 dealer bundles	43.00
No. 2 bundles	32.00
Mixed steel scrap	40.00
Busheling	34.00
Bush., new fact., prep'd	43.00
Bush., new fact., unprep'd	37.00
Machine shop turn.	22.00
Short steel turn.	30.00
Mixed bor. and turn.	24.00
Rails, rerolling	54.00
Cast scrap	50.00



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IMPORT & EXPORT – **LIVINGSTON & SOUTHARD, INC.,** 99 Park Ave., New York, N. Y. • *Cable Address* **FORENTRACO**

Big Battery Trend Boosts Lead

Lead's biggest market will use more lead in 1957 than the previous year.

Metal for replacement units expected to top 270,000 tons.

More 12-volt batteries will keep consumption heading up.

▪ Battery makers are going to use more lead in 1957 than last year, says B. B. Steiner, president, Assn. of American Battery Manufacturers. This market is lead's biggest, taking about one-third of domestic output.

Mr. Steiner, also president, Cumberland Battery Mfg. Co., figures his industry will consume about 387,000 tons of lead this year, compared to 366,131 tons in 1956.

Here is where the association president expects the battery lead to go:

Domestic Replacement—This is by far the biggest market for battery makers. Mr. Steiner believes this market will take 26,960,000 batteries in 1957. About 271,583 tons of lead will be used, based on his estimate of 20.11 lb of lead per unit.

Original Equipment—Mr. Steiner estimates new vehicle production at a little over 7 million. His statistics indicate consumption of 71-823 tons of lead for batteries for new cars and trucks.

Export Replacement—Pegged at about 400,000 batteries by the battery maker, a little over 4000 tons of lead.

Other—Including original equipment on tractors, off-highway and other vehicles, it will stay about the same as 1956, at 480,000 units, a little over 4800 tons of lead.

Industrial-Type—These batteries will use about 35,000 tons of lead.

Mr. Steiner points out two big reasons why the battery makers will continue to up their annual requirements of lead in the immediate future. One is the increased use of 12-volt batteries in cars. These require more lead.

Bigger Batteries—At the end of 1956, 11,080,000 twelve - volt equipped cars were registered, about 17 pct of total auto registrations. As late as 1953, cars with 12 volt systems made up only .7 pct of total registrations.

The other bright light is the fact that number of vehicles scrapped remains well below new registrations. In 1956, 4,288,000 vehicles left the roads, to be replaced by 6,850,000 new ones. Since the bulk of battery maker business depends on replacements, it is the number of vehicles in operation that counts.

Total number of vehicles registered in 1956 was 64,601,000. This is expected to climb to 67,-079,000 in 1957.

Longer Life—Modifying the brilliant future prospects is the fact that the average life of a battery is steadily increasing. The Assn. of American Battery Mfg. says the average life of a battery made today is well over 28 months. In 1947 it was 16 months.

Tin

The tin market in New York remains sluggish. Several major tin traders say consumers are still working off inventories as much as possible. This, they say, will probably continue until (1) business conditions for the rest of the year are more clearly defined, or (2) the price firms up.

Some consumers, recently conspicuous by their absence from the market, are reported in for small tonnages. But they are very much in the minority, and there is still little premium for spot tin.

Rumors Growing — New York traders say it's likely that the International Tin Agreement buffer stock manager is quietly buying tin. This could be a factor in firming up the market in a hurry. If it's true, it will manifest itself in a gradual decline in the amount of metal up for sale. This could bring all hold-out consumers on the market at the same time.

Singapore Up—Another sign that the market will firm soon is that as trading closed last week, the Singapore price hit its highest point since the buffer stock buying range was altered. Some of this metal will hit New York markets in about three months. Whether it is sold as future tin enroute, or spot when it arrives, the asking price is bound to be higher.

Tin prices for the week: April 24—100.00; April 25—100.25; April 26—99.75; April 29—99.25; April 30—99.25.*

* Estimate

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum ingot	27.10	25.90	8/10/56
Aluminum pig	25.60	24.00	8/10/56
Copper (E)	32.06	34.00	2/18/57
Copper (CS)	31.00	31.50-31.00	4/12/57
Copper (L)	32.00	34.00	2/19/57
Lead, St. L.	15.80	16.30	1/13/56
Lead, N. Y.	16.00	16.50	1/13/56
Magnesium ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	250-275	270-300	12/4/56
Zinc, E. St. L.	13.50	13.00	1/6/56
Zinc, N. Y.	14.00	13.50	1/6/56

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig. Velasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. TIN: see above; other primary prices, pg. 148.

more and more manufacturers are saying: "Let's use

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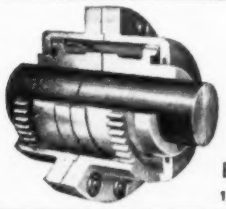

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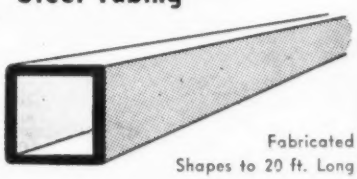
SPECIAL . . .
Square & Rectangular Steel Tubing

Fabricated to Your Exact Length
2 x 4 to 8 x 8
10 Gauge to ⅜" Wall



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FABRICATORS FOR INDUSTRY SINCE 1928
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Low in Cost. Durable. Easy to operate.
Table adjustable for straight or taper keyways.
Three sizes. Keyways 1/16" up to 1".
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Tube Cutting Off
Metal Scrap Bundling

ESTABLISHED SINCE 1868

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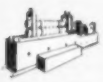
CONE TYPE PAY OFF REEL

COMPLETE SLITTING LINE

PRESS FEEDER WITH CONTROL PANEL


72" SLITTER

72" MANDREL UNCOILER

SCRAP BALLER

SLITTER KNIVES

SHIMS

SPACERS

RUBBER DOUGHNUTS

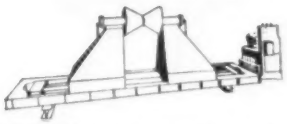
UNCOILER WITH COIL BUGGY

72" RECOILER

HYDRAULIC UPENDER

CONTROL PANEL

Heavy Duty CONE TYPE UNCOILERS



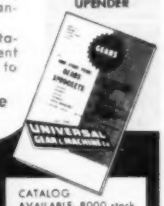
UNIVERSAL cone type uncoilers are designed to handle coils from 12 inches to 104 inches wide, and from 500 pounds to 100,000 pounds in weight. The inside diameters of standard coils may be from 12 inches to 32 inches; and the outside diameter as high as 86 inches, depending on coil weights. Other than standard size coils are listed in the specifications of each machine.

Coil cradles also available.

All models are available with the following optional items: Friction brakes, air brakes, threading motors and scanning devices.

Send your specifications for quotations or find out how your present cone-type recoiler can be rebuilt to incorporate these features.

Machinery Catalog Available



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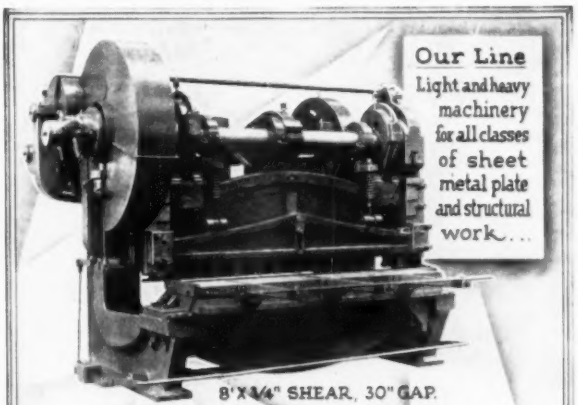
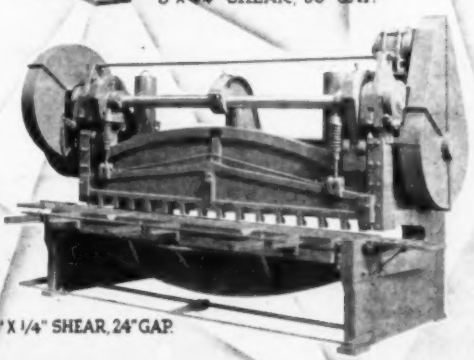


Our Line
Light and heavy machinery for all classes of sheet metal plate and structural work. . .

8' X 1/4" SHEAR, 30" GAP.



10' X 1/4" SHEAR, 24" GAP.

BERTSCH & COMPANY
CAMBRIDGE CITY INDIANA

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3.
1800, 1100, 3003	44.3	42.1	40.9	40.2
5052	51.8	46.8	45.1	42.9
6061-0	48.9	44.6	42.8	42.6

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	42.7-44.4	57.6-61.1
12-14	43.4-44.8	58.4-62.7
24-26	46.4-46.9	68.7-73.1
36-38	54.8-55.4	91.5-94.9

Screw Machine Stock—2011-T-3

Size"	¾	⅞-1⅜	1¼-1	1¼-1½
Price	59.7	58.8	57.4	55.2

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.352	$1.803	$2.254	$2.704
.024 gage	1.686	2.252	2.815	3.378

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	250-3.00	250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	128
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included on 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	54.13	.....	51.36	54.32
Brass, 70/30	47.52	48.06	47.46	50.43
Brass, Low	50.20	50.74	50.14	53.01
Brass, R.L.	51.14	51.68	51.08	53.95
Brass, Naval	51.69	.....	46.00	55.10
Muntz Metal	49.79	.....	45.60	.....
Comm. Bz.	52.63	53.17	52.57	55.19
Mang. Bz.	55.43	.....	49.53	.....
Phos. Bz. 5%	73.17	.....	73.67	.....

Free Cutting Brass Rod $37.68

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $11.00-$12.10; alloy, $14.75; Plate, HR, commercially pure, $9.25-$9.75; alloy, $11.25. Wire, rolled and/or drawn, commercially pure, $8.50-$9.00; alloy, $11.00; Bar, HR or forged, commercially pure, $7.10-$7.35; alloy, $7.10-$7.30; billets, HR, commercially pure, $6.85-$7.10; alloy, $6.85-$7.05.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Antimony, American, Laredo, Tex... 33.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb cont'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.9%, small lots ..... $ 4.55
Chromium, 99.8% metallic basis ... $ 1.31
Cobalt, 97-99% (per lb) ....$2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined .....$48.50-$53.50
Gold, U. S. Treas., per troy oz. $35.00
Indium, 99.9% dollars per troy oz...$ 2.25
Iridium, dollars per troy oz....$90 to $100
Lithium, 98% .....$11.00 to $14.00
Magnesium, sticks, 100 to 500 lb... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York .....$255 to $257
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz...$23 to $24
Platinum, dollars per troy oz....$92 to $95
Rhodium .....$120.00 to $125.00
Silver ingots (¢ per troy oz.) 91.375
Thorium, per kg. $43.00
Uranium, normal per kg. $40.00
Vanadium .....$ 3.45
Zirconium sponge $10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 31.50
No. 120 ..... 30.00
No. 123 ..... 28.50
80-10-10 ingot
No. 305 ..... 35.50
No. 315 ..... 33.50
88-10-2 ingot
No. 210 ..... 43.25
No. 215 ..... 40.00
No. 245 ..... 35.50
Yellow ingot
No. 405 ..... 25.25
Manganese bronze
No. 421 ..... 28.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 24.50-25.25
0.60 copper max. 24.25-25.00
Piston alloys (No. 122 type)...22.25-23.50
No. 12 alum. (No. 2 grade)...21.50-22.50
108 alloy 22.00-22.50
195 alloy 24.00-25.50
13 alloy (0.60 copper max.)...24.25-25.00
AXS-679 .....22.00-22.50

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 22.50-23.25
Grade 2—92-95% 21.50-22.00
Grade 3—90-92% 20.50-21.50
Grade 4—85-90% 19.50-20.25

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	28	27¼
Yellow brass	21⅞	20⅛
Red brass	25	24¼
Comm. bronze	25⅞	25⅛
Mang. bronze	20½	19¾
Yellow brass rod ends	21⅝	....

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire..... 26¾
No. 2 copper wire..... 25¼
Light copper 23
*Refinery brass 24¼
Copper bearing material 23¾
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire..... 26¾
No. 2 copper wire..... 25¼
Light copper 23
No. 1 composition 23¼
No. 1 comp. turnings 22¾
Hvy. yellow brass solids..... 17
Brass pipe 19
Radiators 18

Aluminum

Mixed old cast..... 13½—14
Mixed new clips ..... 15½—16
Mixed turnings, dry ..... 14½—15

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 24 —24¼
No. 2 copper wire ..... 22½—23
Light copper ..... 20¾—21¼
Auto radiators (unsweated).. 15¾—16
No. 1 composition ..... 21 —21½
No. 1 composition turnings... 20½—21
Cocks and faucets ..... 16½—17
Clean heavy yellow brass.... 14½—15
Brass pipe ..... 17 —17½
New soft brass clippings .... 19 —19½
No. 1 brass rod turnings .... 16¼—16½

Aluminum

Alum. pistons and struts .... 5½— 6
Aluminum crankcases ..... 10½—11
1100 (2S) aluminum clippings 13½—14
Old sheet and utensils ..... 10½—11
Borings and turnings ..... 6½— 7
Industrial castings ..... 10½—11
2024 (24S) clippings ..... 12 —12½

Zinc

New zinc clippings ..... 6½— 7
Old zinc ..... 4½— 5
Zinc routings ..... 2½— 2¾
Old die cast scrap ..... 2¼— 2½

Nickel and Monel

Pure nickel clippings ..... $1.15-$1.25
Clean nickel turnings ..... $1.10-$1.15
Nickel anodes ..... $1.15-$1.25
Nickel rod ends ..... $1.15-$1.25
New Monel clippings 50-55
Clean Monel turnings 45-50
Old sheet Monel 50-55
Nickel silver clippings, mixed. 21
Nickel silver turnings, mixed. 18

Lead

Soft scrap lead ..... 12 —12½
Battery plates (dry) ..... 6½— 6¾
Batteries, acid free ..... 3¾— 4

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixed common babbitt ..... 12 —12½
Solder joints ..... 17½—18
Siphon tops 42
Small foundry type ..... 14¼—14½
Monotype ..... 14 —14½
Lino. and stereotype ..... 13 —13½
Electrotype ..... 12½—12¾
Hand picked type shells ..... 9½—10
Lino. and stereo. dross ..... 4¾— 5
Electro. dross ..... 4 — 4¼

IRON AGE

STEEL PRICES

(Effective April 30, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b., mill in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$107.00 *B3*		5.05 *B3*	7.40 *B3*	5.05 *B3*						
	Buffalo, N. Y.	$74.00 *B3, R3*	$91.50 *B3, R3*	$107.00 *B3, R3*	5.90 *B3*	5.05 *B3*	7.40 *B3*	5.05 *B3*	4.675 *B3, R3*	6.85 *R7*	6.95 *B3*			
	Claymont, Del.													
	Harrison, N. J.													14.55 *C11*
	Conshohocken, Pa.		$96.50 *A2*	$114.00 *A2*					4.725 *A2*	6.90 *A2*	6.95 *A2*			
	New Bedford, Mass.									7.30 *R6*				
	Johnstown, Pa.	$74.00 *B3*	$91.50 *B3*	$107.00 *B3*		5.05 *B3*	7.40 *B3*							
	Boston, Mass.									7.40 *T8*				14.90 *T8*
	New Haven, Conn.									7.30 *D1*				
	Baltimore, Md.									6.85 *T8*				
	Phoenixville, Pa.					5.85 *P2*		5.85 *P2*						
	Sparrows Pt., Md.								4.675 *B3*		6.95 *B3*			
	Bridgeport, Wallingford, Conn.	$79.00 *N8*	$96.50 *N8*	$107.00 *N8*						7.30 *W1* 6.95 *N8*				
	Pawtucket, R. I. Worcester, Mass.									7.48 *A5,N7*				14.90 *N7*
MIDDLE WEST	Alton, Ill.								4.875 *L1*					
	Ashland, Ky.								4.675 *A7*					
	Canton-Massillon, Dover, Ohio		$94.00 *R3*	$107.00 *R3, T5*						6.85 *G4*		10.10 *G4*		14.55 *G4*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$74.00 *U1, R3*	$91.50 *U1, R3,W8*	$107.00 *U1, R3,W8*	5.90 *U1*	5.00 *U1,W8* 5.00 *P13*	7.35 *U1,Y1* 6.00 *W8*	5.00 *U1*	4.675 *N4* 4.675 *A1*	6.95 *A1,T8* 6.95 *M8*			7.75 *W8, S9*	14.55 *A1, S9,T8*
	Cleveland, Ohio									6.85 *A5,J3*			7.75 *J3*	
	Detroit, Mich.			$107.00 *R5*					4.775 *G3, M2*	6.95 *M2,G3, D2,P11*	7.05 *G3*	10.10 *G3, D2*	7.75 *G3*	
	Anderson, Ind.									6.85 *G4*		10.10 *G4*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$74.00 *U1*	$91.50 *U1*	$107.00 *U1, Y1*	5.90 *I3*	5.00 *U1*	7.35 *U1,I3*	5.25 *I3*	4.675 *U1, I3,Y1*	6.85 *Y1*	6.95 *U1, I3,Y1*	10.20 *Y1*	7.75 *U1, Y1*	
	Sterling, Ill.	$74.00 *N4*				5.00 *N4*			4.775 *N4*					
	Indianapolis, Ind.									7.00 *C5*				
	Newport, Ky.												7.75 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$91.50 *S1, C10*	$107.00 *S1, C10*					4.675 *S1, R3*	6.85 *T4*	6.95 *S1, R3*	10.00 *S1, R3*	7.75 *S1*	14.55 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$74.00 *U1*	$91.50 *U1, C11*	$107.00 *U1, C11*	5.90 *U1*	5.00 *U1, J3*	7.35 *U1, J3*	5.00 *U1*	4.675 *P6*	5.750 *P6* 6.85 *J3,B4, S7*			7.75 *S9*	14.55 *S9*
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					5.00 *W3*			4.675 *W3*	6.85 *W3,F3*	6.95 *W3*	9.65 *W3*		
	Youngstown, Ohio	$74.00 *R3*	$91.50 *Y1, C10*	$107.00 *Y1*			7.35 *Y1*			6.85 *Y1,C5*	6.95 *U1, Y1*	10.20 *Y1*	7.75 *U1, Y1*	
WEST	Fontana, Cal.	$83.50 *K1*	$101.00 *K1*	$128.00 *K1*		5.75 *K1*	8.10 *K1*	5.90 *K1*	5.525 *K1*	8.70 *K1*				
	Geneva, Utah		$91.50 *C7*			5.00 *C7*	7.35 *C7*							
	Kansas City, Mo.					5.10 *S2*	7.45 *S2*		4.925 *S2*		7.20 *S2*			
	Los Angeles, Torrance, Cal.		$101.00 *B2*	$127.00 *B2*		5.70 *C7, B2*	8.05 *B2*		5.425 *B2, C7*	8.90 *C1*			8.95 *B2*	
	Minnequa, Colo.					5.30 *C6*			5.775 *C6*					
	Portland, Ore.					5.75 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$101.00 *B2*			5.65 *B2*	8.00 *B2*		5.425 *C7,B2*					
	Seattle, Wash.		$105.00 *B2*			5.75 *B2*	8.10 *B2*		5.675 *B2*					
SOUTH	Atlanta, Ga.								4.875 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$74.00 *T2*	$91.50 *T2*			5.00 *T2,R3* 5.00 *C16*	7.35 *T2*		4.675 *T2,R3* 4.975 *C10* 4.675 *C16*		6.95 *T2*			
	Houston, Lone Star, Texas	$80.00 *L3*	$96.50 *S2*	$112.00 *S2*		5.10 *S2*	7.45 *S2*		4.925 *S2*		7.20 *S2*			

IRON AGE

STEEL PRICES

(Effective April 30, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25 lb. base box	Holloware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.675 *B3*	5.75 *B3*				6.90 *B3*	8.525 *B3*			5.80 *W6*			
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.725 *A2*	5.80 *A2*				6.95 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										5.80 *B3*			
	Fairless, Pa.	4.725 *U1*	5.80 *U1*				6.95 *U1*	8.275 *U1*				$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.675 *B3*	5.75 *B3*	6.30 *B3*			6.90 *B3*	8.575 *B3*	9.275 *B3*		5.90 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.										6.10 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										6.00 *L1*			
	Ashland, Ky.	4.675 *A7*		6.30 *A7*	6.325 *A7*									
	Canton-Massillon, Dover, Ohio			6.30 *R3,R1*										
	Chicago, Joliet, Ill.	4.675 *W8, A1*					6.90 *U1*			5.80 *K2*	5.80 *A5,R3, N4,W8,K2*			
	Sterling, Ill.										5.90 *N4, K2*			
	Cleveland, Ohio	4.675 *J3, R3*	5.75 *J3, R3*		6.325 *R3*		6.90 *R3*	8.525 *R3, J3*			5.80 *A5*			
	Detroit, Mich.	4.775 *G3, M2*	5.85 *G3* 5.75 *M2*				7.00 *G2*	8.625 *G3*						
	Newport, Ky.	4.675 *A9*	5.75 *A9*											
	Gary, Ind. Harbor, Indiana	4.675 *U1, I3,Y1*	5.75 *U1, I3,Y1*	6.30 *U1, I3*	6.325 *U1, I3,Y1*	6.70 *U1*	6.90 *U1, Y1,I3*	8.525 *U1, Y1*			5.80 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1,Y1*	7.50 *U1, Y1*
	Granite City, Ill.	4.875 *G2*	5.95 *G2*	6.50 *G2*	6.525 *G2*								$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.40 *C9*							5.90 *C9*			
	Mansfield, Ohio		5.75 *E2*			6.70 *E2*								
	Middletown, Ohio		5.75 *A7*	6.30 *A7*	6.325 *A7*	6.70 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.675 *S1, R3,N3*	5.75 *R3*	6.30 *R3*	6.325 *N3*	6.70 *N3*	6.90 *S1, R3*	8.525 *S1, R3*					$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.675 *U1, J3,P6*	5.75 *U1, J3,P6*	6.30 *U1, J3*	6.325 *U1*		6.90 *U1, J3,R3*	8.525 *U1, J3*	9.275 *U1*		5.80 *A5, P6,J3*	$10.05 *J3, U1*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.675 *P7*	5.75 *P7*								5.80 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.675 *W3, W5*	5.75 *W3, W5,F3*	6.30 *W3, W5*		6.70 *W3, W5*	6.90 *W3*	8.525 *W3*				$10.05 *W5, W3*	$8.75 *W5, W3*	7.50 *W5*
	Youngstown, Ohio	4.675 *U1, Y1*	5.75 *Y1*		6.325 *Y1*		6.90 *Y1*	8.525 *Y1*			5.80 *Y1*			
WEST	Fontana, Cal.	5.525 *K1*	7.00 *K1*				7.75 *K1*	9.775 *K1*				$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	4.775 *C7*												
	Kansas City, Mo.										6.05 *S2*			
	Los Angeles, Torrance, Cal.										6.60 *B2*			
	Minnequa, Colo.										6.05 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.375 *C7*	6.70 *C7*	7.05 *C7*							6.60 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.675 *T2, R3*	.575 *T2*	6.30 *T2, R3*							5.80 *T2,R3*	$10.15 *T2*	$8. 85*T2*	
	Houston, Tex.										6.05 *S2*			

† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box.

* COKES: 1.50-lb. add 25¢.

ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.

IRON AGE

STEEL PRICES

(Effective April 30, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.125 *B3*	8.325 *B3*	7.40 *B3*					
	Buffalo, N. Y.	5.075 *B3,R3*	5.075 *B3,R3*	6.90 *B5*	6.125 *B3,R3*	8.325 *B5,B3*	7.40 *B3*	4.85 *B3*				7.20 *W6*
	Claymont, Del.							5.70 *C4*		6.85 *C4*	7.55 *C4*	
	Coatesville, Pa.							5.25 *L4*		6.85 *L4*	7.55 *L4*	
	Conshohocken, Pa.							4.95 *A2*	5.925 *A2*	6.85 *A2*	7.25 *A2*	
	Harrisburg, Pa.							5.80 *P2*	6.275 *P2*			
	Hartford, Conn.			7.35-*R3*		8.625 *R3*	7.40 *B3*					
	Johnstown, Pa.	5.075 *B3*	5.075 *B3*		6.125 *B3*			4.85 *B3*		6.85 *B3*	7.25 *B3*	7.20 *B3*
	Fairless, Pa.	5.225 *U1*	5.225 *U1*		6.275 *U1*							
	Newark, N. J.			7.30 *W10*		8.50 *W10*						
	Camden, N. J.			7.30 *P10*		8.50 *P10*						
	Bridgeport, Conn. Putnam, Conn.	5.30 *N8*	5.30 *N8*	7.20 *N8* 7.40 *W10*	6.20 *N8*	8.475 *N8*	7.50 *N8*					
	Sparrows Pt., Md.		5.075 *B3*					4.85 *B3*		6.85 *B3*	6.85 *B3*	7.30 *B3*
	Palmer, Worcester, Readville, Mass. Milton, Mass.	5.225 *M7*	5.225 *M7*	7.40 *B5,C14*		8.625 *A5*						7.50 *A5,W6*
						8.625 *B5*						9.025 *T8*
	Spring City, Pa.			7.30 *K4*		8.50 *K4*						
MIDDLE WEST	Alton, Ill.	5.275 *L1*										7.40 *L1*
	Ashland, Newport, Ky.							4.85 *A7,A9*		6.85 *A9*		
	Canton, Massillon, Ohio			6.85 *R3,R2*	6.125 *R3,T5*	8.325 *R3,R2, T5*						
	Chicago, Joliet, Ill.	5.075 *U1,R3, W8,N4* 5.075 *P13*	5.075 *U1,R3, N4* 5.075 *P13*	6.85 *A5,B5, W10,L2 W8,N9*	6.125 *U1,R3, W8*	8.325 *A5,B5, W8,L2,N9, W10*	5.875 *W8* 7.425 *U1*	4.85 *U1,I3, W8,A1*	5.925 *U1*	6.85 *U1,W8*	7.25 *U1*	7.20 *A5,K2 R3,N4,W7*
	Cleveland, Ohio	5.075 *R3*	5.075 *R3*	6.85 *A5,C13*		8.325 *A5,C13*	7.425 *R3*	4.95 *J3,R3*	5.925 *J3*		7.25 *J3,R3*	7.20 *A5, C13*
	Detroit, Mich.	5.175 *G3*	5.425 *G3*	7.05 *B5,P8* 7.10 *P3* 6.85 *R5*	6.225 *G3* 6.125 *R5*	8.525 *B5,P3, P8* 8.325 *R5*	7.525 *G3*	4.95 *G3*		6.90 *G3*		
	Duluth Minn.											7.20 *A5*
	Gary, Ind. Harbor, Crawfordsville	5.075 *U1,I3, Y1*	5.075 *U1,I3, Y1*	6.85 *R3,M5*	6.125 *U1,I3, Y1*	8.325 *R3,M4*	7.425 *U1,I3, Y1*	4.85 *U1,I3, Y1*	5.925 *I3*	6.85 *U1,Y1*	7.25 *U1,Y1*	7.30 *M4*
	Granite City, Ill.							5.05 *G2*				
	Kokomo, Ind.											7.30 *C9*
	Sterling, Ill.	5.175 *N4*	5.175 *N4*					4.85 *N4*				7.30 *K2*
	Niles, Warren, Ohio Sharon, Pa.			6.85 *C10*	6.125 *C10,S1*	8.325 *C10*	7.425 *S1*	4.85 *S1,R3*		6.85 *S1*	7.25 *S1,R3*	
	Pittsburgh, Pa. Midland, Pa.	5.075 *U1, C11,J3*	5.075 *U1,J3*	6.85 *A5,C8, J3,R3,S9, B4,W10,C11*	6.125 *U1, C11,J3*	8.325 *A5,R3, S9,C8,W10, C11*	7.425 *U1,J3*	4.85 *U1,J3*	5.925 *U1*	6.85 *U1,J3*	7.25 *U1,J3*	7.20 *A5,J3, P6*
	Portsmouth, Ohio											7.20 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							4.85 *W5*				
	Youngstown, Ohio	5.075 *U1, Y1,R3*	5.075 *U1, Y1,R3*	6.85 *U1,Y1, F2*	6.125 *U1,Y1*	8.325 *Y1,F2*	7.425 *U1,Y1*	4.85 *U1,Y1, R3*		6.85 *Y1*	7.25 *Y1* 7.25 *U1*	7.20 *Y1*
WEST	Emeryville, Cal.	5.825 *J5*	5.825 *J5*									
	Fontana, Cal.	5.775 *K1*	5.775 *K1*		7.175 *K1*		8.125 *K1*	5.60 *K1*		7.60 *K1*	8.00 *K1*	
	Geneva, Utah							4.85 *C7*			7.25 *C7*	
	Kansas City, Mo.	5.325 *S2*	5.325 *S2*		6.375 *S2*		7.675 *S2*					7.45 *S2*
	Los Angeles, Torrance, Cal.	5.775 *C7,B2*	5.775 *C7,B2*	8.30 *R3,P14*	7.175 *B2*	10.20 *P14*	8.125 *B2*					8.15 *B2*
	Minnequa, Colo.	5.525 *C6*	5.525 *C6*					5.70 *C6*				7.45 *C6*
	Portland, Ore.	5.825 *O2*	5.825 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	5.775 *C7* 5.825 *B2* 6.025 *P9*	5.775 *C7* 5.825 *B2* 6.025 *P9*				8.175 *B2*					8.15 *C7,C6*
	Seattle, Wash.	5.825 *B2, N6*	5.825 *B2*				8.175 *B2*	5.75 *B2*		7.75 *B2*	8.15 *B2*	
SOUTH	Atlanta, Ga.	5.275 *A8*										7.40 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.075 *T2,R3* 5.075 *C16*	5.075 *T2,R3* 5.075 *C16*	7.45 *C16*			7.425 *T2*	4.85 *T2,R3*			7.25 *T2*	7.20 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.325 *S2*	5.325 *S2*		6.375 *S2*		7.675 *S2*	4.95 *S2* 5.20 *L3*		6.95 *S2*	7.35 *S2*	7.45 *S2*

† Merchant Quality—Specialty Quality .35¢ higher.

STEEL PRICES *(Effective April 30, 1957)*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland.
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metals Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
H1 Hanna Furnace Corp., Detroit
I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	7.25	+8.00	10.25	+4.00	13.75	0.50	16.25	1.25	16.75	2.25	17.25	2.75	18.75	2.50								
Youngstown *R3*	9.25	+10.00	12.25	+6.00	15.75	+1.50	18.25	0.25	18.75	1.25	19.25	1.75	20.75	2.50								
Fontana *K1*	+3.75	+19.00	+0.75	+15.00	2.75	+10.50	5.25	+9.75	5.75	+8.75	6.25	+8.25	7.75	+8.50								
Pittsburgh *J3*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25	5.25	+20.25	1.25	+16.50	3.75	+13.00	5.25	+11.50
Alton, Ill. *L1*	7.25	+8.00	10.25	+4.00	13.75	0.50	16.25	1.25	16.75	2.25	17.25	2.75	18.75	2.50								
Sharon *M3*	9.25	+10.00	12.25	+2.00	15.75	+1.50	18.25	0.25	18.75	1.25	19.25	1.75	20.75	2.50								
Fairless *N2*	7.25	+8.00	10.25	+4.00	13.75	0.50	16.25	1.25	16.75	2.25	17.25	2.75	18.75	2.50								
Pittsburgh *N1*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25	5.25	+20.25	1.25	+16.50	3.75	+13.00	5.25	+11.50
Wheeling *W5*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25								
Wheatland *W4*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25								
Youngstown *Y1*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25	5.25	+20.25	1.25	+16.50	3.75	+13.00	5.25	+11.50
Indiana Harbor *Y1*	8.25	+9.00	13.25	+2.00	14.75	1.50	17.25	2.25	17.75	3.25	18.25	3.75	19.75	4.25								
Lorain *N2*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25	5.25	+20.25	1.25	+16.50	3.75	+13.00	5.25	+11.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	11.75	+2.00	15.75	2.00	18.75	6.50	19.25	5.25	19.75	6.25	20.25	6.75	20.75	5.50								
Youngstown *R3*	13.75	+4.00	17.75	list	20.75	4.50	21.25	4.25	21.75	5.25	22.25	5.75	22.75	5.50								
Fairless *N2*	11.75	+2.00	15.75	2.00	18.75	6.50	19.25	5.25	19.75	6.25	20.25	6.75	20.75	5.50								
Fontana *K1*	0.75		4.75		7.75		8.25		8.75		9.25		9.75									
Pittsburgh *J3*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50
Alton, Ill. *L1*	11.75	+2.00	15.75	2.00	18.75	6.50	19.25	5.25	19.75	6.25	20.25	6.75	20.75	5.50								
Sharon *M3*	13.75	+4.00	17.75	list	20.75	4.50	21.25	4.25	21.75	5.25	22.25	5.75	22.75	5.50								
Pittsburgh *N1*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50
Wheeling *W5*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50								
Wheatland *W4*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50								
Youngstown *Y1*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50
Indiana Harbor *Y1*	12.75	+1.00	16.75	3.00	19.75	7.50	20.25	6.25	20.75	7.25	21.25	7.75	21.75	6.50								
Lorain *N2*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in. 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.68	T-1
18	4	1	—	5	2.385	T-4
18	4	2	—	—	1.185	T-2
1.5	4	1.5	8	—	1.04	M-1
6	4	3	6	—	1.43	M-3
6	4	2	5	—	1.185	M-2

High-carbon chromium	.83 D-3, D-5
Oil hardened manganese	.45 O-2
Special carbon	.41 W-1
Extra carbon	.345 W-1
Regular carbon	.29 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (A3, J2, L4) 10 pct	15 pct	20 pct	Sheet (I2) 20 pct
Stainless Type	302				35.50
	304	34.60	38.00	41.50	37.75
	316	39.70	43.20	46.65	55.50
	321	36.35	39.80	43.50	44.75
	347	39.50	43.95	48.45	54.25
	405	29.20	33.15	37.05	
	410, 430	28.70	32.65	36.55	

CR Strip (S9) Copper, 10 pct, 2 sides, 39.85; 1 side, 33.00.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	9.00	9.20	
Armature	10.35	10.35	10.85
Elect.	11.00	11.025	11.525
Motor	12.05	12.075	12.575
Dynamo	13.05	13.05	13.55
Trans. 72	14.05	14.05	14.55
Trans. 65	14.60	Grain Oriented	
Trans. 58	15.10	Trans. 80	18.50
Trans. 52	16.15	Trans. 73	19.00

Producing points: Beech Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3) (20¢ higher, HR); Zanesville, Butler (A7).

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Annld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City R3	167	181	195	187	8.10	8.50
Aliquippa, Pa. J3***	164	179		181	8.20	8.875
Atlanta A8**	166	182	192	190	8.05	8.65
Bartonville K2**	166	182	198	190	8.30	9.06
Buffalo W6					8.20	8.75
Chicago, Ill. N4**	164	180	167 196	188	8.35	9.10
Cleveland A6	173				8.20	8.75
Cleveland A5					8.20	
Crawfordsville M4**	166	182	198	190	8.30	9.05
Donora, Pa. A5	164	176	196	184	8.20	8.75
Duluth A5	164	176	167 196	184	8.20	8.75
Fairfield, Ala. T2	164	176	196	184	8.20	8.75
Galveston D4	169;					
Houston S2	169	181	195	189	8.45	9.00
Johnstown, Pa. B3**	164	180	167	188	8.20	8.95
Joliet, Ill. A5	164	176	196	184	8.20	8.75
Kokomo, Ind. C9*	166	178	198	186	8.30	8.85
Los Angeles B2**					9.15	9.90
Kansas City S2*	169	181	195	189	8.45	9.00
Minnequa C6†	169	181	172 195	189	8.45	9.00
Monessen P6	167	185		191	8.10	8.10
Palmer, Mass. W6					8.50	9.05
Pittsburg, Cal. C7	183	199	220	204	9.15	9.70
Rankin, Pa. A5	164	176		184	8.20	8.75
So. Chicago R3	167	181	195	187	8.10	8.50
S. San Francisco C6†			214		9.15	9.70
Sparrows Pt. B3**	166		198	190	8.30	9.05
Struthers, O. Y1*					8.20	8.85
Worcester A5	170				8.50	9.05
Williamsport, Pa. S5			175			

* Zinc less than .10¢. † Plus zinc extras.
** 13.5 zinc. ‡ Wholesalers only
*** .10¢ zinc.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Baltimore, Md. T8	9.20	10.40	12.60	15.60	18.55
Bristol, Conn. W12		10.40	12.60	15.60	18.55
Boston T8	9.20	10.40	12.60	15.60	18.55
Buffalo, N. Y. R7	8.65	10.10	12.30	15.30	18.25
Carnegie, Pa. S9	8.65	10.10	12.30	15.30	
Cleveland A5	8.65	10.10	12.30	15.30	18.25
Detroit D1	8.75	10.20	12.40	15.40	
Detroit D2	8.75	10.20	12.40		
Dover, O. G4	8.65	10.10	12.30	15.30	18.25
Evanston, Ill. M8	8.65	10.10	12.30		
Franklin Park, Ill. T8	8.75	10.10	12.30	15.30	18.25
Harrison, N. J. C11			12.60	15.60	18.55
Indianapolis C5	8.80	10.25	12.30	15.30	18.25
Los Angeles	10.85	12.30	14.50		
New Castle, Pa. B4	8.65	10.10	12.30	15.30	
New Haven, Conn. D1	9.10	10.40	12.60	15.60	
Pawtucket, R. I. N7	9.20	10.40	12.60	15.60	18.55
Pittsburgh S7	8.65	10.10	12.30	15.30	18.25
Riverdale, Ill. A1	8.75	10.10	12.30	15.30	18.25
Sharon, Pa. S1	8.65	10.10	12.30	15.30	18.25
Trenton R4	11.05	10.40	12.60	15.60	18.55
Wallingford W1	9.10	10.40	12.60	15.60	18.45
Warren, Ohio T4	8.65	10.10	12.30	15.30	18.25
Worcester, Mass. A5	9.20	10.40	12.60	15.60	18.55
Youngstown C5	8.65	10.10	12.30	15.30	18.25

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	36.34	42.56	33.21	
	2½	12	48.94	57.31	44.73	
	3	12	56.51	66.18	51.66	
	3½	11	65.97	77.25	60.30	
	4	10	87.61	102.59	80.07	
National Tube	2	13	36.34	42.56	33.21	
	2½	12	48.94	57.31	44.73	
	3	12	56.51	66.18	51.66	
	3½	11	65.97	77.25	60.30	
	4	10	87.61	102.59	80.07	
Pittsburgh Steel	2	13	36.34	42.56		
	2½	12	48.94	57.31		
	3	12	56.51	66.18		
	3½	11	65.97	77.25		
	4	10	87.61	102.59		

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets Hot-Rolled (16 ga. & hvr.)	Sheets Cold-Rolled (15 gage)	Sheets Galvanized (10 gage)††	Strip Hot-Rolled	Plates	Shapes Standard Structural	Bars Hot-Rolled (merchant)	Bars Hot-Rolled (special quality)	Bars Cold-Finished	Alloy Bars Hot-Rolled 4615 As rolled	Alloy Bars Hot-Rolled 4140 Annealed	Alloy Bars Cold-Drawn 4615 As rolled	Alloy Bars Cold-Drawn 4140 Annealed
Atlanta		8.17	9.37	9.83	8.21	8.55	8.59	8.45	....	10.23	....	....	....	....
Baltimore	$.10	7.98	9.08	9.31	8.46	8.36	8.57–8.85	8.53	....	9.23	14.99	14.44	18.39	18.09
Birmingham	.15	7.68–7.80	8.88–9.00	9.52	7.78–7.82	8.01–8.16	8.05–8.20	8.07	8.44	10.04–10.12	....	....	....	....
Boston	.10	8.94	9.98	11.16	8.99	9.28	9.20	9.17	9.57	....	15.79	14.79	19.14	18.39
Buffalo	.15	8.00	9.15	10.90	8.20	8.65	8.65	8.40	8.85	8.85	15.65	14.65	19.01	18.25
Chicago	.15	7.95	9.15	9.85	7.97	8.31	8.35	8.22	8.50	8.50	15.30	14.30	18.65	17.90
Cincinnati	.15	8.09	9.20	9.90	8.29	8.67	8.89	8.53	8.87	8.99	15.61	14.61	18.96	18.21
Cleveland	.15	7.93	9.13	9.75	8.07	8.54	8.72	8.31	8.67	8.75	15.39	14.39	18.74	17.99
Denver		9.70	11.30	12.49	9.80	9.70	9.80	9.95	....	10.65	....	....	....	17.60
Detroit	.15	8.18	9.40	10.20	8.32	8.66	8.89	8.52	8.86	8.85	15.46	14.56	18.81	18.16
Houston		8.80	9.75	....	8.85	8.80	9.10	9.15	....	10.65	15.50	....	19.30	19.05
Kansas City	.20	8.52	9.72	10.07	8.60	8.83	8.87	8.73	....	9.42	15.32	14.77	18.72	18.42
Los Angeles	.10	9.20	10.40	11.35	9.25	9.75	9.25	9.10	9.30	12.20	16.45	15.60	20.30	19.70
Memphis	.15	8.02	9.22	....	8.12	8.35	8.39	8.25	....	9.85	....	....	....	....
Milwaukee	.15	8.08	9.28	9.98	8.10	8.44	8.56	8.35	8.71	8.72	15.43	14.43	18.78	18.03
New York	.10	8.55	9.76	10.33	9.00	9.11	9.01	9.11	9.48	....	15.02	14.69	18.42	18.29
Norfolk	.20	8.00	....	....	8.40	8.35	8.70	8.45	....	10.70	....	....	....	....
Philadelphia	.10	8.25	9.17	10.39	8.92	8.78	8.80	8.81	9.18	9.41	15.61	14.61	18.96	18.21
Pittsburgh	.15	7.93	9.14	10.20	8.07	8.31	8.35	8.22	8.59	8.75	15.30	14.30	18.65	17.90
Portland		9.20	9.65	11.60	10.25–11.05	9.00	9.35	9.45	....	13.80	16.70	16.10	20.40	20.25
San Francisco	.10	9.05	10.40	11.05	9.05	9.30	9.15	9.15	9.90	12.40	16.45	15.60	20.30	19.70
Seattle		9.55	10.70	11.65	9.55	9.30	9.35	9.50	9.85	13.40	16.55	15.85	19.50	19.45
Spokane	.15	9.70	10.85	11.80	9.70	9.45	9.50	9.65	10.00	13.55	....	16.75	....	20.35
St. Louis	.15	8.29	9.49	10.21	8.34	8.67	8.82	8.58	8.96	9.11	15.66	14.66	19.01	18.26
St. Paul	.15	8.39	9.59	10.31	8.43	8.90	8.94–9.09	8.53	....	9.21	....	14.62	....	18.27

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.
†16 gage. †† 13½¢ zinc. ‡ Deduct for country delivery.

(Effective April 30, 1957)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.275	6.25	6.60				
Cleveland							13.85
So. Chicago *R3*				9.225			
Ensley *T2*	5.275	6.25					
Fairfield *T2*		6.25		9.225		6.275	
Gary *U1*	5.275					6.275	
Huntington *C16*		6.25					
Ind. Harbor *I3*	5.275		6.60	9.225		6.275	
Ind. Harbor *Y1*				9.225			
Johnstown *B3*		6.25					
Joliet *U1*			6.60				
Kansas City *S2*				9.225			13.85
Lackawanna *B4*	5.275	6.25	6.60			6.275	
Lebanon *B3*							13.85
Minnequa *C6*	5.275	6.75	6.60	9.225		6.275	13.85
Pittsburgh *P5*							13.85
Pittsburgh *J3*				9.225			
Seattle *B2*				9.725		6.425	13.85
Steelton *B3*	5.275		6.60			6.275	13.85
Struthers *Y1*				9.225			
Torrance *C7*						6.425	
Williamsport *S5*		6.15					
Youngstown *R3*				9.225			

COKE

Furnace, beehive (f.o.b. oven) Net-Ton
Connellsville, Pa. ..... $15.00 to $15.75
Foundry, beehive (f.o.b. oven)
$17.50 to $19.00
Foundry oven coke
Buffalo, del'd $31.75
Detroit, f.o.b. 30.50
New England, del'd 31.55
Kearney, N. J., f.o.b. 29.75
Philadelphia, f.o.b. 29.50
Swedeland, Pa., f.o.b. 29.50
Painesville, Ohio, f.o.b. 30.50
Erie, Pa., f.o.b. 30.50
Cleveland, del'd 32.65
Cincinnati, del'd 31.84
St. Paul, f.o.b. 29.75
St. Louis, f.o.b. 31.50
Birmingham, f.o.b. 28.85
Milwaukee, f.o.b. 30.50
Neville, Is., Pa. 29.25

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	24.75	40	100, 110	10.70
20	72	24.00	35	110	10.70
16 to 18	72	24.50	30	110	10.85
14	72	25.00	24	72 to 84	11.25
12	72	25.50	20	90	11.00
10	60	26.50	17	72	11.40
8	48	27.00	14	72	11.85
7	60	26.75	12	60	12.95
6	60	30.00	10	60	13.00
4	40	33.25	8	60	13.30
3	40	35.25			
2½	30	37.25			
2	24	57.75			

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper
Cast elliptical, 18 in. or longer, 5000 lb lots 49.42
Electrodeposited 39.25
Brass, 80-20, ball anodes, 2000 lb or more 50.00
Zinc, ball anodes, 2000 lb lots 21.25
(for elliptical add 2¢ per lb)
Nickel, 99 pct plus, rolled carbon, 5000 lb $1.0225
(Rolled depolarized add 3¢ per lb)
Cadmium $1.70
Tin, ball anodes and elliptical $1.07 per in.

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum 76.00
Copper sulphate, 100 lb bags, per cwt. 24.35
Nickel salts, single, 100 lb bags ... 40.50
Nickel chloride, freight allowed, 300 lb 45.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums 23.05
(Philadelphia price 23.30)
Zinc cyanide, 100 to 900 lb 55.55
Potassium cyanide, 100 lb drum N. Y. 48.00
Chromic acid, flake type, 1 to 20 100-499 lb drums 31.75

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)
Pct Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
½" and smaller x 6" and shorter	52½	56½	58½	59½
⅝" thru 1" x longer than 6"	43½	47½	50	51½
Rolled thread carriage bolts ½ in. & smaller x 6 in. and shorter	52½	56½	58½	59½
Lag, all diam. x 6" & shorter	52½	56	58	59
Lag, all diam. longer than 6 in.	44½	48	50	51
Plow bolts, ½" and smaller x 6" and shorter	52	55½	57	58

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.

	Full Case or Keg Price
¾ in. or smaller	61½
⅞ in. to 1 in. inclusive	57½
1⅛ in. to 1½ in. inclusive	62½
1⅝ in. and larger	56

C. P. Hex reg. & hvy.

¾ in. and smaller	61½
⅞ in. to 1½ in. inclusive	57½
1⅝ in. and larger	56

Hot Galv. Nuts (All Types)

¾ in. and smaller	48

Semi-finished Hex Nuts

¾ in. or smaller	61½
⅞ in. to 1½ in. inclusive	57½
1⅝ in. and larger	56

(Add 25 pct for broken case or keg quantities)

Finished

1 in. and smaller	64

Rivets

Base per 100 lb

½ in. and larger	$11.50

Pct Off List

7/16 in. and smaller	23

Cap Screws

Discount (Packages)
Bright Treated H. C. Heat

New std. hex head, packaged		
⅝" diam. and smaller x 6" and shorter	44	31
¾" ⅞" and 1" diam. x 6" and shorter	27	9
⅝" diam. and smaller x longer than 6"	14	+ 6
¾", ⅞" and 1" diam. & longer than 6"	⅓	+24

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	44	61
¾" through 1" dia. x 6" and shorter	27	49

Minimum quantity—¼" through ⅝" diam., 15,000 pieces; 1/16" through ¼" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Discount Mach. Screws	Stove Bolts
Cartons	19	32
Bulk — *Quantity*		
To ¼" diam. incl. — 25,000-200,000	9	54
5/16 to ½" diam. incl. — 15,000-100,000	9	54
All diam. over 3" long — 5,000-100,000	—	54

Machine Screw & Stove Bolt Nuts

	Discount Hex	Square
In cartons	16	19
Quantity		
In Bulk ⅝" diam. & smaller — 15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	119.0
New York	131.7
Chicago	134.1
San Francisco-L. A.	141.8

Dec. 1955 value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$105.00
Standards chemically bonded, Curtiner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard, Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite

St. ⅝ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.00
Midwest	16.35
Missouri Valley	15.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh

Swedish sponge iron f.o.b. Riverton, N. J., ocean bags	8.50¢
Canadian sponge iron, Del'd in East, carloads	9.5¢
Domestic sponge iron, 98+% Fe, carload lots	8.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron size 5 to 10 micron, 98%, 99.8+% Fe.	86.0¢ to $1.55
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	37.50¢ to 50.00¢
Copper, electrolytic	49.75¢
Copper, reduced	49.75¢
Cadmium, 100-199 lb, 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe .03 max. Del'd	$5.00
Lead	8.90¢ plus metal value
Manganese f.o.b. Exton, Pa.	46.0¢
Molybdenum, 99%	$3.60 to $3.95
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	99.0¢
Stainless steel, 316	$1.32
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$4.00 (nominal)
Zinc, 10 ton lots	18.75¢ to 32.50¢

FERROALLOY PRICES

(Effective April 30, 1957)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C	41.50	0.20% C	38.50
0.03% C	41.00	0.50% C	38.25
0.06% C	39.50	1.00% C	37.50
0.10% C	39.00	1.50% C	37.35
0.15% C	38.75	2.00% C	37.25

4.00-4.50% C, 67.70% Cr, 1-2% Si... 27.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.75
0.025% C (Simplex) 34.75
0.10% C, 50-52% Cr, 2% max Si ... 35.50
8.50% max. C, 50-55% Cr, 3-6% Si 24.00
8.50% C, 50-55% Cr, 3% max. Si... 24.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.31
0.50% max. C	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe	1.40

Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.

Carloads	44.65
Ton lots	48.95
Less ton lots	51.45

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.
30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Maganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	24.25
Ton lots	26.15
Less ton lots	27.15

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 15 mesh.

Ton lots	20.15
Less ton lots	21.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	17.30
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.75
Johnstown, Pa.	12.75
Sheridan, Pa.	12.75
Philo, Ohio	12.75
S. Duquesne	12.75

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:	
Carloads, bulk	14.80
Ton lots packed	17.20

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn... 25.50

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si....	28.60	31.40	32.60

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	12.80
Ton lots	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Ton lots, packed	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe	23.70	22.40
98% Si, 0.75% Fe	24.45	23.15

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Contract prices, cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si	13.00	75% Si	16.40
65% Si	15.25	85% Si	18.10
	90% Si	19.50	

Ferrovanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

Openhearth	3.20
Crucible	3.30
High speed steel (Primos)	3.40

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Alsifer, 20% Al, 40% Si, 40% Fe.

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound

Contained Mo	$1.28

Ferrocolumbium, 50-50%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	$5.10
Less ton lots	5.15

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd ton lots, 2-in. x D per lb con't Sb plus Ta..... $4.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton..... $90.00
10 tons to less carload..... $110.00

Ferrotitanium, 40% regular grade

0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb. contained Ti..... $1.35

Ferrotitanium, 25% low carbon,

0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down, packed, per pounds contained W, ton lots delivered..... $2.95 (nominal)

Molybdic oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa. $1.41

bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.33

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 contract, basis, per pound contained V_2O_5 ..... $1.38

Zirconium contract basis, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed	27.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload	$5.50

Bortam, f.o.b. Niagara Falls,

Ton lots per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.

Ton lots per pound	14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.... 1.20

F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight, allowed, 100 lb and over

No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots..... $2.15

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All Types

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For All Types of Cars

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"ANYTHING containing IRON or STEEL"

Detroit Waits For Spring Pickup

Used machinery dealers there are hopeful despite auto market slowdown and the effects of tight money.

They're predicting an upswing during this quarter.

▪ While business has been quite slow in the Detroit area, dealers there are hopeful it will warm up as the weather does.

Main reason for the decline is the present condition of the automotive market. But dealers believe that once spring gets underway, their business will pick up accordingly.

Delayed Action — Another factor contributing to slow sales is the scarcity of ready cash. Dealers report losing sales because of the shortage of money. Buyers are inclined to wait longer to make a purchase and in some cases have decided not to buy at all.

Still, dealers are hopeful that the situation will ease now that the time for tax payments has passed.

Business from outside the area is still good. As one dealer puts it, "If it were not for the out-of-state demand, we would really be in trouble."

Neighbors Help—The demand is especially good from the neighboring states of Illinois, Indiana and Ohio. Some dealers are even selling on the East Coast. One reason for the brisk out-of-state demand is the fact that manufacturing is more diversified in these areas. In Detroit, used machinery customers are mostly concerned with automotive programs.

The demand from other areas is especially strong for tool room equipment. One dealer reports that his supply of late model shapers is down to nothing. He is also having trouble obtaining good boring mills for some customers.

Certain presses are also in short supply. This is particularly true of those with special bed sizes and certain 2-crank presses.

Automotive Jobbing Slack — Locally, there is some demand for horizontal boring mills but most of these are being shipped out of town. Production equipment is generally slow.

Dealers are puzzled by this. It is a known fact that some of the automotive programs for 1958 are rather large. The only explanation offered is that the automakers are doing most of their own work in captive shops.

Hopeful But—Rebuilding parts have suddenly become easier to obtain. This is partly attributed to the possibility that orders for new machine tools have fallen off slightly and builders have more time to concentrate on replacement parts.

The outlook for the second quarter is optimistic but tempered with a great deal of caution. Dealers feel that once the spring auto selling season gets into full swing, automakers will really begin to move on new model programs and it will be reflected in small job shops.

At the same time, the trade is aware that the vacation season begins in June and this could contribute to a continued slowdown in demand.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
6' x 3/16" Niagara Initial Type
16' x ⅝" Ransomie Pyramid Type
BRAKES—LEAF TYPE
8' x 3/16" Dreis & Krump
12' x ¼" Dreis & Krump
BRAKES—PRESS TYPE
12' x 5/16" Cincinnati—NEW
14' x ¼" Superior Hydraulic—NEW
BULLDOZERS
#27 W&W, 22" Stroke, 16" x 80" Face of Crosshead
#7 Ajax, 22" Stroke, 12" x 65" Face of Crosshead
CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton P&H	56' Span 220/3/60
5 ton Whiting	48' Span 230/3/60 A.C.
5 ton Whiting	56' Span 230 Volt D.C.
8 ton P&H	55' Span 220/3/60
10 ton P&H	38' Span 230 Volt D.C.
10 ton Shepard Niles	58' Span 220/2/60
15 ton Shepard Niles	52' Span 230 Volt D.C.
25 ton Cleveland	70' Span 220/3/60
With 10 ton Auxiliary (Mill Type)	

CRANE TROLLEY
10 ton P&H Type HMR Crane Trolley, Motors 440/3/60, Magnetorque Contractor, Panel and Electric Brake. NEW
DIEING MACHINE
60 ton Henry & Wright, Roll Feed, Scrap Cutter 4" Stroke NEW 1950
DRAW BENCH
10,000# Aetna Standard, Length of Draw 44'. Used to draw S.A.E. 1035 Welded Steel Tubing
FORGING MACHINES
1" to 5" Acme, Ajax, National
2" Acme Model XN, Air Clutch, NEW 1954
HAMMERS—BROAD DROP—STEAM DROP—STEAM FORGING—800 lb to 20,000 lb.
LEVELERS—ROLLER
35" Torrington, 19 Roll 1-31/32" Dia. Backed up
19" Aetna Standard, 17 Rolls 3¾" Dia.
54" McKay, 17 Rolls, 3¾" Dia.
108" American, 17 Rolls, 4½" Dia.
PLANER—PLATE EDGE
35" Southwark Pneumatic Holddown, Motor Driven, Capacity 1½"
PRESSES—HYDRAULIC
200 ton Bliss Hydro Dynamic, 36" Stroke Bed Area 30" x 31"
2800 ton Bliss Hydro Dynamic, 12" Stroke, 60-15/16" Between Columns
4500 Baldwin-Lima-Hamilton Hydr. Forging Press
PRESS—INCLINABLE
#A6½ Niagara 190 ton, 9¾" Stroke Bed Area 32⅝" x 50⅝"
PRESSES—STRAIGHT SIDE
Clearing F-1300-42, 300 ton, 24" Stroke, Bed 44 x 36"
Bliss #1018 Toggle Drawing 1550 ton, Strokes 24" and 12" Die Space 60" x 72"
PUNCH & SHEAR COMBINATIONS
Cleveland Style EF Single End, 42" Throat
Cleveland Style G Single End, 60" Throat
Cleveland Style W, 60" Throat
No. 1½ Buffalo Univeral Ironworker
ROLL—FORMING
14 Stand Tishken Model L-M-1, Spindle Dia. 1½" 6½" Between Spindles, 3½" Capacity
ROLLING MILLS
6" x 5" Torrington Wire Flattening Mill Line
9" Bar Mill
10" x 14" Single Stand Two High
12" x 12 Single Stand Two High
12" x 16" Single Stand Two High
16" x 21" Farrel Two Stand Two High
26" x 72" Cold Rolling Mill
44" x 144" Three High Sheet Mill
22" x 40" Three High Sheet Mill
SHEAR—ALLIGATOR
No. 4 Mesta RH LK, Capacity 2" x 12"
SHEAR—BAR
No. 12 Buffalo Armor Plate
Capacity 5" to 15" Beams & Channels
SHEARS—SQUARING
6' x 10" Ga. Niagara No. 672
8' x ⅛" Niagara—NEW 1952
12" x ½" Cincinnati
SLITTERS
25" Blake & Johnson
36" Wean Slitting Line
36" Paxson Slitting Line
STRAIGHTENERS
No. 3 Medart 3 Roll, Capacity to 4½" Tubing
Kane & Roach Type B Capy. ⅞" Hex. Flat 4" x 11/32" Flat & Edge 1⅞" x 3/16"
SWAGING MACHINES
#4F Fenn, Capacity 2¼" Tubing, LATE
#6½A Fen. Capacity 2¼" Tube, 3¾" Solid 10" Die Length Hydraulic Feed. LATE
TESTING MACHINES
20,000# Baldwin Universal Hydraulic
60,000, 100,000, 200,000 Olsen & Riehle Universal
50,000 and 300,000 lb Compression
TUBE MILL
Etna 1K Welded Tube Mill, Cut-off & Transformer Capy. ½" OD 0.28 wall to 2" OD 120 wall

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No. 16A2 Blanchard 2 spdl. automatic surface grinder, late.
No. 72 Hanchett rotary surface grinder with 3 heads.
No. 4 Gallmeyer & Livingston univ. tool and cutter grinder.
HAMMERS
No. 6 B Nazel pneumatic forging with motor
No. 6 I Nazel pneumatic forging with motor.
No. 3C Chambersburg self contained, with motor.
Mureo 100 lb. upright power hammer, arranged motor drive.
LATHES
126" swing over bed, 96 foot centers Niles, Bement Pond, gear head engine lathe PRT to two carriages.
90" swing Betts Bridgeford late type heavy duty engine lathe headstock mounted on short lathe bed section.
72" swing Betts Bridgeford heavy duty lathe headstock.
Model 6DREL Potter & Johnston mfg. automatic chucking and turning.
No. 5 Gisholt univ. ram type turret lathe, chuck and bar feed.
28" 8' centers Betts Bridgeford axle lathe.
MILLS-BORING, HORIZONTAL, VERTICAL
4-36 Cincinnati hydromatic production mill.
72" King vertical boring and turning with 2 swivel hds. on rail.
4" bar Univ. Tri-Way horizontal boring, milling and drilling.
3¾" No. 5 DeRance horizontal boring, milling and drilling.
3" Universal Tri-Way horizontal boring, milling and drilling.
54" Newton 2 spdl. continuous rotary.
PRESSES
600 ton No. 664 Toledo knuckle joint, coining or embossing.
500 ton No. 1039 Hamilton dbl. crank.
200 ton No. 7 x 72" Bliss dbl. crank straight side.
150 ton Model 60D66 Cleveland straight side double crank.
350 ton No. 18T Cleveland single crank, double action, toggle drawing.
350 ton Elmes self contained hydraulic.
250 ton Williams & White hydraulic.
800 ton Model 2E48-800 Hamilton straight side single crank, air clutch.
160 ton Model 12E Cleveland straight side, eccentric shaft.
750 ton No. 3 National Maxipress, forging.

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MILES MACHINERY CO.
PHONE SAGINAW PL 2-3105
2041 E. GENESEE AVE. SAGINAW, MICH.

REBUILT — GUARANTEED ELECTRICAL EQUIPMENT

TRANSFORMERS (Power)
Outdoor Type — Oil Cooled

Qu.	KVA	Make	Phase	Voltages
1	2500	G.E.	3	66,000-Y-2300
3	2000	Al.Ch.	1	26,400/13,200-2300/4160-Y
3	1667	G.E.	1	4800-480
3	1000	Al.Ch.	1	33,000-2300/4000-Y
3	1000	G.E.	1	22,000-2300/4000-Y
3	500	Kuhlman	1	13,860-230/480
3	333	G.E.	1	13,200-2300/4000-Y
3	333	Kuhlman	1	13,200-240/480
3	333	G.E.	1	4160/7200-120/240/480
6	333	American	1	2400/4160-120/240
1	300	Whse.	3	11,500-440
4*	225	Whse.	3	2400/4160-250/144
1	150	Kuhlman	1	13,200-120/240
1	100	G.E.	1	4160-120/240

*—Dry Type

METAL-CLAD SWITCHGEAR

5—G.E. cubicle with type FK-255 draw-out 3-P.S.T. magnetic O.C.B., 600 amps., 15,000-volts, 150,000-I.C.

1—G.E. cubicle with 3-P.S.T., air-circuit breakers, type AL-2-75, 3000 amps., 600-VAC, 250-VDC, motor operated, O.L. & LV protection time delay relays.

1—Cubicle with Roller Smith 3-P.S.T., 600 amps, 4160 volt, magnetic O.C.B., type 50 T.C.L., with CT'S, PT and relays for OL & LV protection.

1—Whse. Distribution Cubicle 92" H. x 108" W. x 46" D., consists of 12 separate compartments each with its door and (1) manual operated air breaker type DA-50, 600 amps., 600-V., 3-P.S.T., (3) with 3-O.L. relays (9) with 2-O.L. relays, complete all bus and connections.

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4302 Clarissa St., Philadelphia 40, Penna.
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Phone Davenport 4-8300

RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT
DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	2200	G.E.	MCF	600	400/500
3	1375	G.E.	MCF	415	1300
1	1000	G.E.	MCF	600	350/700
1	940	Whse.	QM	250	140/170
1	800	Whse.		230	250/350
		With United Gear Set 7:1 Ratio			
1	500	Whse.	CO-214	600	300/900
3	450	Whse.		550	415
2	300	G.E.	MPC	230	400
1	250	G.E.	MPC	230	400/600
1	200	Whse.	CB-5113	250	400/800
2	200	Whse.	CB-207.4	250	850/1200
1	150	G.E.	CD B.B.	600	250/700
1	150	Cr.Wh.	65-H	230	1150
2	125	Whse.	SK-185	230	350/1050
1	125	Whse.	SK-183	230	850
2	100	Whse.	SK-181	230	450/1000
1	60/100	G.E.	RF-17	230	450/900
2	75	Cr.Wh.	53H TEFC	230	860
1	50	G.E.	MD-412-AE	230	550
6	40	Rel.	185F TEFC BB	230	500/1500
2	30/40	Whse.	SK-131.5-BB DP	230	500/1500

MG SETS — 3 Ph. 60 Cy.

Qu.	KW	Make	RPM	DC Volts	AC Volts
2	2000/2400	G.E.	450	250/300	2300/4600
1	2000	G.E.	500		
			25 cy.	660	11000
1	2000	G.E.	514	600	2300/4600
1	1500	G.E.	720	600	4600/13200
3	1000	G.E.	720	600	4600/13200
2	1000	G.E.	514	600	4600/13200
1	750	G.E.	720	125/250	2300/4600
1	500	G.E.	900	540/540	4150
1	500	Whse.	900	125/250	440
2	300	G.E.	1200	250	2300
2	800	Whse.	1200	275	440/2300
1	200	Whse	1200	550	2300

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
1	3000	A.C.	OISC	3	33000 x 2300
1	1500	G.E. auto	HT	3	4000/4200/4400
3	1000	G.E.	HTDDJ	1	2400 x 480
3	1000	G.E.	OA/FA	1	13800 x 230/460
1	833	G.E.	H	1	13800 x 460
2	750	G.E.	Pyranol	1	4800 x 85/55
3	500	Kuhl.	OISC	1	13200 x 4600
1	500	G.E.	OISC	1	13200 x 2300
1	500	G.E.	HS	1	13800 x 600
3	300	G.E.	HT	3	4160 x 480-277
3	250	L.M.	OISC	1	12800 x 240/120
1	200	G.E.	AirCooled	3	432/480 x 120/208Y
3	150	G.E.	OISC		33000 x 2300/4000Y

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47 Howell Street, Jersey City 6, N. J.

BRAKE MOTORS

30 HP Master Gearmotor 56 RPM Exp Prf Sterns Magnetic Brake. 220/440/3/60.
20 HP Westinghouse CS. TEFC, 1160 RPM 404s, Sterns Mag. Brake. 440/3/60.
2 HP General Electric Gearmotor 71 RPM Integral GE Disc Brake. 440/3/60.

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30 Church Street **New York 7, N. Y.**

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10' x ¼"	No. 150-10,	150 ton, 12' bed
10' x 3/16"	No. 120-10,	120 ton, 12' bed
10' x 8 ga.	No. 100-10,	100 ton, 12' bed

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3" Red Ring Gear Shaver, 1942.
3" Gleason Str. Gear Gens. 1942.
Fellows Str. Line Gear Gens. 1942.
No. 12 B & S Mills, 1938.

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2—28" 3-HIGH ROLL STANDS with inlet, outlet and intermediate tables. Will produce 4" sq. billets from 8" sq. blooms in 6 passes. Includes bloom shear.
1—28" REVERSING BREAKDOWN MILL.
1—25" & 42" x 60" HOT STRIP MILL, 4-high.
1—28" PINION STAND, 2-high, modern design.
1—16" x 24" COLD MILL, 1 stand.
2—10" x 10" 2-HIGH COLD MILLS, combination pinion stand and gear set, extra forged steel rolls.
1—10" ROD MILL.
2—MECHANICAL COOLING BEDS for bars, 150 ft. and 120 ft. long.
1—ROLL FORMING MACHINE, Kane & Roach for .072" x 5⅝" wide stock.
1—COIL-UP-AND-DOWN ENDER for 54" dia. x 44" wide coils.
1—34" x 192" ROLL GRINDER with motors and controls.
1—44" ROLL LATHE, enclosed headstock, tailstock, piano rest, 20 HP 500/1500 RPM, 230 volts D.C. motor and controls.
2—ROLLER LEVELERS, McKay, rolls 80" face x 5¼" dia., with gear box and universal spindles.
1—STRETCHER LEVELER for sheets, 500,000 lb. capacity.
1—KANE & ROACH BAR AND ANGLE STRAIGHTENER, size #5, cap. 4" x 4" x ½" angles, 5" channels, 2½" bars.
2—KANE & ROACH BAR AND ANGLE STRAIGHTENERS, size #4, cap. 3" x 3" x ⅜" angles, 3½" channels and 2" bars.
1—LOCOMOTIVE, 62½ ton Diesel Electric.
2—UNITED HOT SAWS, 50", sliding frame.
1—BONNOT BILLETEER, size "A", cap. 3" to 6" Squares.
1—UNITED #4 BAR SHEAR, vertical open side.
1—PELS BILLET AND BAR SHEAR, cap. 7" round, 50 HP motor.
1—CRACKER SHEAR, AETNA-STANDARD, 2⅛" bars.
1—ALLIGATOR SHEAR, cap. 4" sq. or 5" rd., with 35 HP motor, blades 23½" long, weight 60,000 lbs.
1—ROTARY SIDE TRIMMING SHEAR, capacity 112" x ⅝" plate.
1—192" x 10 GAUGE NIAGARA SQUARING SHEAR, little used.
1—150" x ¼" SHEET SQUARING SHEAR.
1—SLITTING SHEAR FOR SHEETS, Mesta 92".
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2—PACK FURNACES for hot sheet mills, 62" x 60', double chamber.
1—66" GALVANIZING LINE for sheets, with 2 roller levelers.
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1—3500 HP GEAR DRIVE, 514 to 80 RPM, 6.45 to 1 ratio.
1—2000 HP GEAR DRIVE, 200/580 RPM input, 4.44 to 1 ratio.
1—1800 HP GEAR DRIVE, 514 to 87 RPM, 5.9 to 1 ratio.
1—1200 HP GEAR DRIVE, 353 to 94.6 RPM, 3.73 to 1 ratio.
1—3500 HP MOTOR, 11000 volts, 3 phase, 60 cycle, 514 RPM.
1—1200 HP MOTOR, 2200 volts, 3 phase, 60 cycle, 353 RPM.
1—MC-30 WEST. MOTOR, 230 V. D.C. back axle brackets and shaft.
1—MC-20 WEST. MOTOR, 230 V. D.C. back axle brackets and shaft.

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BRAND NEW
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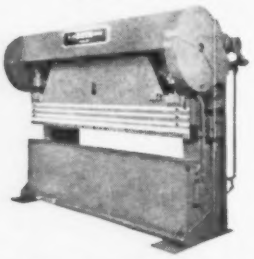

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#100- 8	8' x 3/16"	10' Bed
#100-10	10' x 8 GA.	12' Bed
#120-10	10' x 3/16"	12' Bed
#150- 8	8' x 5/16"	10' Bed
#150-10	10' x 1/4"	12' Bed

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4 spindle 2" Model K Cleveland, m.d.
4 spindle Model RAS National Acme-Acme Gridley, 2" cap., m.d.
2" Cleveland Model A, single spindle, m.d.
2½" Cleveland, m.d., Model A
No. 8A Cleveland, m.d., 8" cap., latest
No. 4D Potter & Johnston, m.d.
No. 5DELX Potter & Johnston, m.d., late

MISCELLANEOUS
Model RP Tompkins & Johnson Pneumatic Riveting Mach. with cylinder
No. 56 Sundstrand Double End Centering Machine, m.d.
No. 53A Sundstrand Double End Opposed Type Drilling & Centering Machine
Model 20074 Logansport Arbor Press
No. 125 Marken Marking Machine, m.d.
Sciaky Type PMCO-25-31 Storage of Energy Spot Welder, 50 KW, 34" throat
No. 70 Cross Deburring Machine, m.d., 1940
Pratt & Whitney Standard Measuring Machine, 36" capacity
Type 114CB Moline Tool Boring Machine, two-spindle type, m.d.
15" Gleason Quenching Press
No. 11 Cochran Bly Saw Sharpener, belt driven
Logan Hydraulic Vertical Shaver, m.d., 6" stroke
Gisholt Precision Balancing Machine, m.d.
Leroe Electric Power Plant
38" face plates, lathe, taper nose, key mounted, new
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24" x 60" Magnetic Chuck
16" x 60" O. S. Walker Magnetic Chuck
Clamping Assembly to fit a 6.2 Denver Acme Turret Lathe
1 ton Shaw Electric Cable Hoist
Brown & Sharpe Universal Attachment, for use on 2A Brown & Sharpe Miller
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15" 3 jaw Logan Steel Body Air Chuck
Model 50M, 50 ton Lempco Hand Operated Hydraulic Press
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3500 KW Allis 250/700 v.—13800/6900, 3/60
1500 KW G.E. 250 volt—4000/2300, 3/60
500 KW West. 250 volt—4000/2300, 3/60
300 KW G.E. 250 volt—4000/2300, 3/60
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25 Transformer and Generating Arc Welders

2500 lb. Model E Chambersburg Steam Drop Hammer, New 1944

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4" National High Duty Upsetting & Forging Machine, air clutch, also one with regular clutch, also 1", 2", 3" air clutch

Williams White Bulldozers from 5-ton to 300-ton

Landis Landmaco and other Landis Threading Machines

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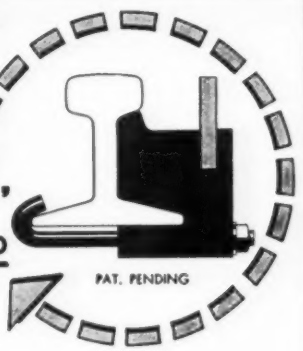

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5—3500-KW, 3 Unit, Allis-Chalmers, Motor Generator Sets, Each consisting of:
2—1750-KW, 250/350 Volts parallel, 500/700 Volts series, 514 RPM, 5000 Amp., type HCC, rated continuous at 40 Deg. C. Allis-Chalmers DC Generators with Class B Insulation, separately excited, direct connected in the center to:
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Each set equipped with a 40-KW exciter for synchronous motor fields, and a 10-KW exciter for generator fields, both 250-VDC at 514 RPM.
All mounted on a structural steel base approximately 27' long x 11' wide.
These Units are of the very latest type and design—condition excellent—were used only a short time—AC and DC Switchgear available. For any additional information and price, please contact one of the following dealers closest to you:

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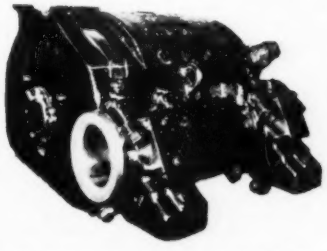

Westinghouse type 970-A; part No. 1296204. Max. HP: intermittent—400 HP @ 550 volts —650 amps. Continuous, with blower—300 HP @ 308 volts—325 amps. Max volts 550 DC—max. amps. 650—max. RPM 2000. 4-Pole series motors. Cooling: Can be force ventilated with small centrifugal fans. Air required, 1400 CFM @ 1.3" static pressure. Originally designed for Whitcomb 65-ton diesel electric locomotive.

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#506 BLISS, S.S.S.C., Tie Rod, Eccentric Shaft, 6" stroke, air cushion, M.D.

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1—INGERSOLL RAND CAMERON Centrifugal Pump & Motor, Model No. E3-EV, Serial No. A433256, with 100 HP Induction Motor; Model 17470, 3 phase, 60 cycle, 440 volts, 1755 RPM. Pump: GPM. 450, 1750 RPM, 462' Head, including 100 HP. Electrical: GE Automatic Compensator CR-7051 K1, 3 phase, 60 cycle, 440 volts. Year Mfg. 1943.
1—INGERSOLL RAND CAMERON Pump & Motor, Size 4HMT-4, Serial No. 01443518, 100 HP G.E. Motor, 440 Volts, Type KT-114A, #5168695, Form EL, 40 degrees, Model 17470. Pump: 450 GPM, 539' Head, Hydro Test 1200, 1750 RPM. Electrical: G.E. Automatic Compensator CR-7051 K1, 3 phase, 60 cycle, 440 v.
1—INGERSOLL RAND CAMERON Single Stage Suction Centrifugal Pump, Size 4RT-4, Serial No. 04523068, 200 HP Reliance Motor, 3550 RPM, 440 volts, Form 0, #71344A1, 239A—Code G, Frame A-50586, 40 degrees. Pump: 450 GPM, 3560 RPM, 1100' Head, 1200 Hydro Test. Year Mfg. 1952. Electrical: G.E. 151-200 HP Automatic Compensator, 3 phase, 60 cycle, 440 volt. CR-7051, Dif. with Enclosure 88 max. Amps 600.
1—WORTHINGTON Pump, Style 5KF365DA7, Serial No. 1038687, Size 1¾ x 4, 30 GPM, 1200 lb. capacity 25 HP G.E. Motor #5334, 1760 RPM, TEPC 220/440, 260 RPM, #5584203, Type KF, Model 14W168M44, Year Mfg. 1941.
1—ALLIS CHALMERS Centrifugal Pump, 3 or 4 Stage, 4" inlet, 3" outlet, 500 lb. pressure, 150 GPM new element, unit direct coupled to 75 HP Crocker Wheeler totally enclosed fan cooled Motor for 3/60/220, 3600 RPM, mounted on base, with Skidmore primer, equipped with Cutler-Hammer Bullet #9105, 75 HP Cross-The-Line Starter.
1—ALLEN SHERMAN HOFF Hydro Seal Pump, Style 5K326876, Serial No. HW18997, 15 HP G.E. Motor, 220/440 volts, 1750 RPM, Year Mfg. 1941.

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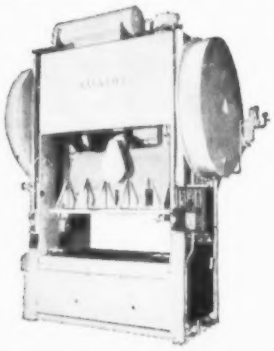

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Congress Warms Up on Union Check

Strong Congressional support appears to be building on the President's request for a public look at the financial records of labor unions. As a result, prospects are good for a law requiring registration, reporting and public disclosure of funds for union health, welfare and pensions.

J&L Shareholders OK Rotary Merger

Jones & Laughlin stockholders have given the company the green light on its proposed acquisition of Rotary Steel. The move would give J&L 300,000 tons of capacity and facilities for wire, bar and semi-finished stainless steel. J&L plans to add a sheet mill for stainless and expects Rotary's sales to increase from last year's $54 million to an annual rate of $100 million toward the end of 1958.

No Decision on Freight Car Program

Railroad officials—wanting more time to consider plans for boosting their stock of freight cars—have deferred decision on the matter until late this month. A major problem still to be worked out is financing the building program.

Fund Cuts Won't Delay Shipbuilding

Despite any cuts Congress makes in Maritime Administration construction funds, shipbuilders will continue busy. East Coast yards have enough business to take them through this year and into the next. West Coast yards are also busy. Meanwhile the House has deleted all but $3 million of the $94.5 million the Maritime Administration asked. A Senate committee is now examining the request.

Scrap Export Limits Are Proposed

The Departments of Commerce and State, reflecting domestic pressure to limit steel scrap exports, have reportedly made a suggestion that the three principal buyers (the United Kingdom, the European Coal & Steel Community and Japan) divide their imports evenly between No. 1 and No. 2 heavy melting scrap, rather than concentrating on the primary grade.

New Tin Mill Prices Now In Effect

Increases in the price of tin plate and tin mill black plate, amounting to 35 cents per base box, which were announced in mid-March, are now in effect. Hollowware enameling is also up the same amount per 100 lb. (For new prices see p. 150.)

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Effective Quality Control through Accurate Hardness Tests

Solve quality control problems with the King Portable Brinell Hardness Tester. Take faster, more accurate hardness readings on heavy, odd-shaped metal parts without elaborate fixturing or cutting samples. The King Portable uses a 3000 kg. load on a 10 mm. ball with automatic relief. Intermediate loads as desired. Weighs less than 30 lb. and takes guaranteed accurate tests anywhere. King Testers are the standard of dependability in portable hardness testing equipment around the world. Write for details and specifications.

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ELECTRIC FURNACE
STEEL CASTINGS
CARBON • ALLOY • STAINLESS
SAND OR SHELL MOLDED

"C" Steel Castings—sand or shell molded—possess qualities far more interesting than the mere strength of steel. For, in addition to strength they provide more efficient design—better weight-strength ratio—and greater fatigue resistance, i.e., longer life and less replacement. Furthermore "C" Steel Castings, because they are truly foundry engineered from pattern to final casting, require minimum machining and provide better fit plus fast assembly.

If you are interested in castings, the know-how, experience and engineering knowledge of our staff are at your service upon request.

CRUCIBLE STEEL CASTING CO.
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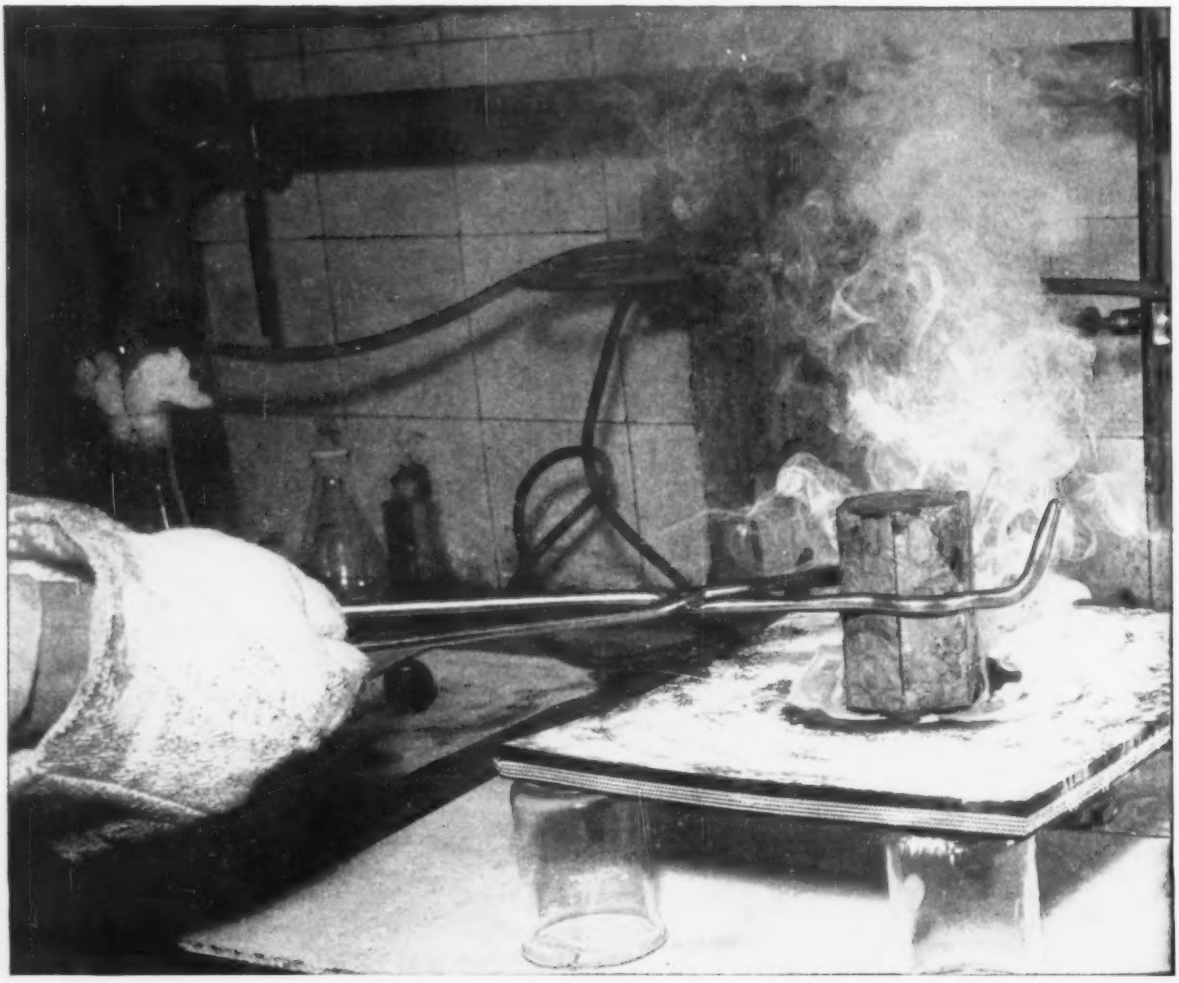
Zinc *STRIP, COILED*
WIRE, COILED
ACCURATELY ROLLED FOR ELECTRIC FUSE ELEMENTS
EYELETS—BRASS, STEEL AND ZINC
THE PLATT BROS. & CO., WATERBURY, CONN.

B.F.Goodrich



Red-hot metal won't burn through this B.F.Goodrich conveyor belt

New fire curtain means longer life for hot-material belts

SCORCHING chunks of metal that sometimes land on foundry conveyor belts won't burn holes through a B. F. Goodrich conveyor belt with the built-in fire curtain.

This new protective shield is two layers of glass fabric that B. F. Goodrich puts into the top cover of hot-material conveyor belts. If a hot chunk of metal accidentally drops on the belt, the rubber cover chars at the spot, but only down to the glass fabric fire curtain. Since the hot object doesn't penetrate the glass fabric barrier, the belt keeps its strength and so, of course, lasts longer than belts without this protection.

To demonstrate the effectiveness of the fire curtain, tests were run on two hot-material belts. One belt had the B. F. Goodrich fire curtain protection; the other did not. A red-hot steel bar was placed on each belt. It burned through the rubber covers on both belts. And it burned a hole clear through the unprotected belt. But the B.F.Goodrich fire curtain stopped the burning chunk, so that the body of the protected belt was undamaged.

The fire curtain protection is ideal for foundry service where burnt holes are the major cause of short belt life. It can be built into any B. F. Goodrich hot-material belt. Talk it over with a B. F. Goodrich distributor and see if this new belting improvement is the answer to your hot material problems. *B. F. Goodrich Industrial Products Company, Dept. M-957, Akron 18, Ohio.*

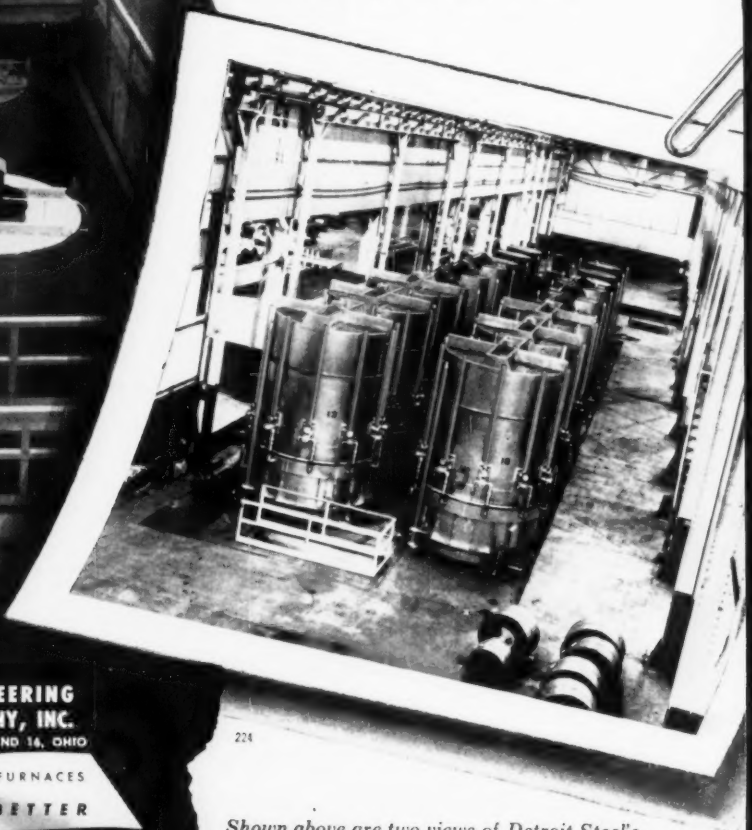
B.F.Goodrich

INDUSTRIAL PRODUCTS

Detroit Steel, too, standardizes on Single Stack Furnaces

The Detroit Steel Corporation is another of the nation's leading steel producers that has standardized on Lee Wilson Single Stack Annealing Furnaces. In their Detroit, New Haven, and Portsmouth plants, Detroit Steel has found these modern Single Stack Furnaces enable them to make every charge they process a special charge. The flexibility of this Single Stack equipment results in faster deliveries of a wider variety of steel specifications—and, thus, outstanding customer service!

Why not have a Lee Wilson annealing engineer show you how, like Detroit Steel, your annealing practice can be improved by standardizing on Lee Wilson SINGLE STACK Furnaces.



Shown above are two views of Detroit Steel's Portsmouth annealing department. It consists of 18 Lee Wilson Furnaces and 48 bases.

Lee Wilson* **ENGINEERING COMPANY, INC.**

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MAKE THE BEST METALS BETTER

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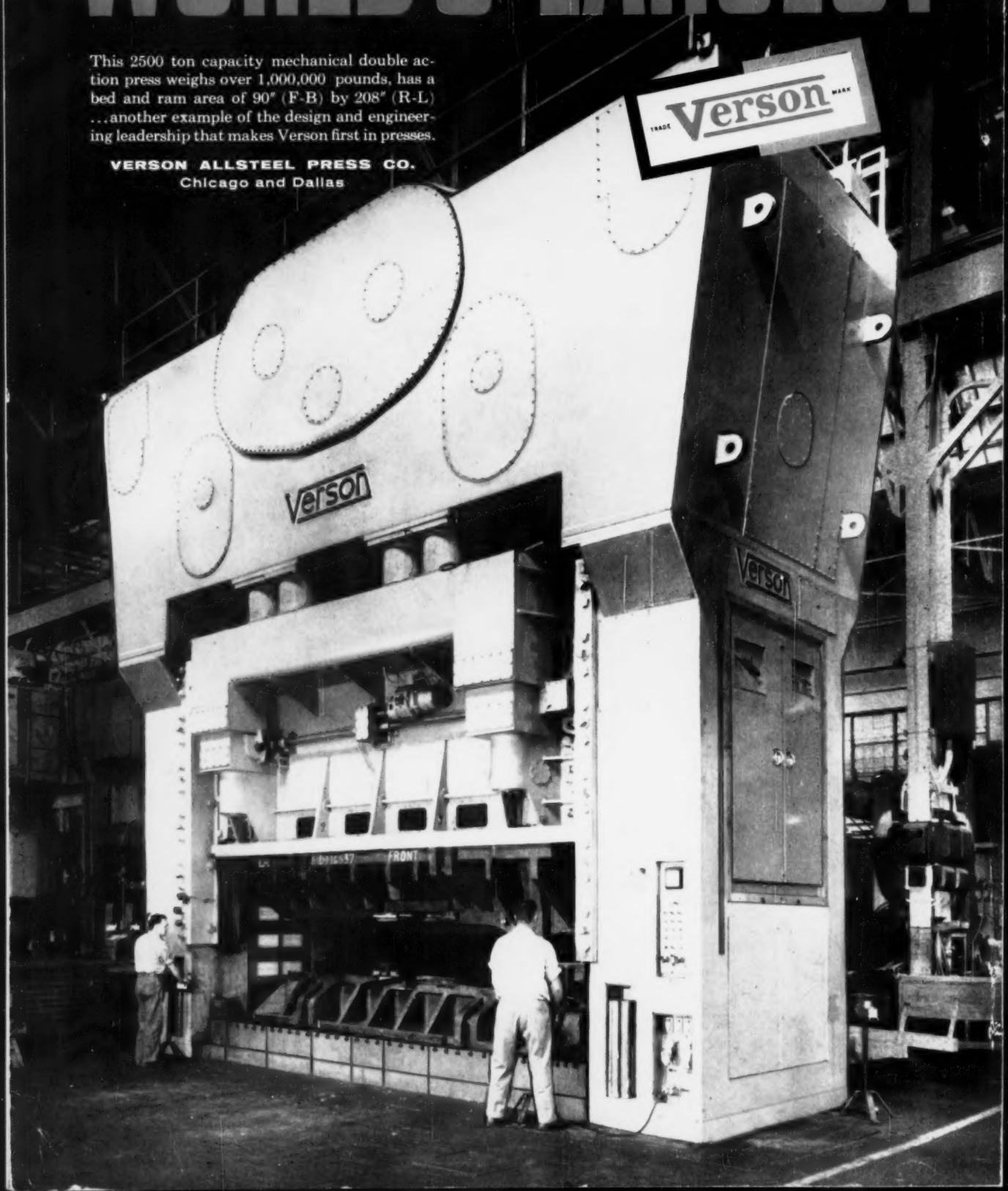
WORLD'S LARGEST

Mechanical Double Action Press . . . by

This 2500 ton capacity mechanical double action press weighs over 1,000,000 pounds, has a bed and ram area of 90″ (F-B) by 208″ (R-L) . . . another example of the design and engineering leadership that makes Verson first in presses.

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